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REPORT

OF THE

WATER SUPPLY COMMISSION

OF

PENNSYLVANIA

FOR THE YEARS

1917-1918

HARRISBURG, PENNA.
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Water Supply Commission of Pennsylvania

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209461

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LETTER OF TRANSMITTAL

Office of the Water Supply Commission,

Harrisburg, December 31, 1918.

His Excellency, the Governor of the Commonwealth of Pennsylvania:
The Members of the Senate and the House of Representatives of the Commonwealth of Pennsylvania:

Gentlemen: I have the honor to submit herewith the report of the Water Supply Commission of Pennsylvania for the years 1917 and 1918.

WATER SUPPLY COMMISSION OF PENNSYLVANIA,

THOMAS J. LYNCH,
Secretary.

REPORT

OF THE

Water Supply Commission of Pennsylvania

FOR THE YEARS

1917-1918

CHAPTER I

INTRODUCTION

The work of the Water Supply Commission during the years 1917-1918 may be briefly described as follows:

INCORPORATION OF WATER AND WATER POWER COMPANIES

Four applications for the incorporation of water supply companies were approved in 1917 and nine in 1918; two companies were granted extensions of time in which to complete their works and approval was given for an additional source of water supply to another company. There were no approvals of water power company applications. One merger agreement and one sale of property and franchises were approved.

Table No. 1 gives the names of the companies, the dates of approval and the territory covered by their charters:

TABLE NO. I

Water Supply Companies Approved During 1917-1918

Name	Date of Approval	Territory Covered By Charter
Citizens Water Co. of Grassflat, Pa.	Feb. 13, 1917	Part of Cooper Twp., Clearfield Co.
Claghorn Water Co.	Jul. 10, 1917	Part of Wheatfield Twp., Indiana Co.
Langloth Water Co.	Oct. 23, 1917	Part of Smith Twp., Washington Co.
Monroe Water Co.	Mar. 13, 1917	Part of Cambria Twp., Cambria Co.
Athens Borough Water Co.	Mar. 19, 1918	Athens Borough, Bradford Co.
Athens Township Water Co.	Mar. 19, 1918	Part of Athens Twp., Bradford Co.
East Deer Water Co.	Apr. 9, 1918	East Deer Twp., Allegheny Co.
Edgeboro Water Co. (The)	Feb. 26, 1918	Bethlehem Twp., Northampton Co.
Hammond Water Co. (The)	Apr. 9, 1918	Butler Twp., Schuylkill Co.
Interborough Water Co.	Sep. 10, 1918	Brackenridge Boro., Allegheny Co.
New River Water Co.	Apr. 9, 1918	Tarentum Boro., Allegheny Co.
Water Company of Sayre, Pa. (The)	Mar. 19, 1918	Part of Sayre Boro., Bradford Co.
Water Gap Water Co.	Apr. 9, 1918	Delaware Water Gap Boro., Monroe Co.

SUPERVISION OF DAMS

The total number of applications received in connection with the construction of new dams or alterations to existing dams was ninety-eight. Ninety permits were issued; forty-five for new dams and an equal number for repairs and alterations. One hundred and fifty-one field examinations were made in connection with applications, either for the purpose of investigation before permits were issued, or for the inspection of construction work in progress. Three hundred and sixty-three examinations, either original or re-examinations for inspection purposes, were made of existing dams, a total of five hundred and fourteen field examinations. An engineer was stationed at Coatesville until the completion of the city's reinforced concrete dam on Rock Run, the construction of which was under constant supervision from its inception.

The following table is a summation of the work done in connection with supervision of dams, since the Commission has exercised jurisdiction over such structures:

TABLE NO. II

	Prior to 1915	1915	1916	1917	1918	Total
Permits for new dams	77	43	28	20	25	193
Permits for modifications or repairs of existing dams,	28	23	31	29	16	127
Progress examinations during construction	284	278	165	89	62	878
Examinations of existing dams	293	348	111	238	125	1,115

OTHER ENCROACHMENTS

Five hundred and forty-four permits were issued for encroachments other than dams in 1917 and two hundred and ninety-nine in 1918. Of the permits issued for the two years, five hundred and seventy-one were for bridges, thirty-six for fills and two hundred and thirty-six for miscellaneous structures, such as walls, piers, ice breakers, etc.

The decreased number of applications submitted during 1917-18 over previous years was due largely to the scarcity and increased cost of labor and materials and the cessation of nearly all work not essential to winning the war. An Act of Assembly, approved July 18, 1917, has also reduced the number of applications submitted for bridges. This Act provides: "that whenever authority has been given by the State Highway Department to township supervisors, under existing laws, or laws that may hereafter be enacted, for the construction, repair, alteration, or maintenance of any township bridge, it shall not be necessary for such township supervisors to procure permits from any other department consenting to the construction, repair, alteration or maintenance of such bridge."

ANTHRACITE COAL REGION—ADDITIONAL WATER SUPPLY—CHAPTER II

The Commission submits in Chapter II an inventory of the domestic and commercial water supply in Pennsylvania relative to a shortage in the southern anthracite coal fields, comprising northern Schuylkill, southern Luzerne, western Carbon, and eastern Columbia Counties. In order to devise a remedy for this condition, which is bound to become more acute as the industries and the population of the section increase, the Water Supply Commission made a careful office study of practicable sources of additional supply and methods of delivery to consumers.

Main streams in the section named are polluted with culm and mine drainage, making them unsuitable for water supply. Thus there are no available sources within its boundaries, and additional supply must be obtained from the outside, where pumping will be required whatever sources may be developed. A reconnaissance map of the surrounding watersheds was used as a basis to determine the available sources of additional supply, methods of delivery and routes for pipe lines. The information thus obtained has been tabulated or plotted in diagrams for ready reference. Consideration of the project was carried to the point where further investigation will necessitate field work. Calculations were made for a period of 35 years, or until 1950. It was reckoned that at that time the water requirement of the territory will be 62,000,000 gallons daily in excess of the safe yield of present requirements. The task which the Commission undertook was to ascertain where this could be obtained.

The most promising sources of additional water supply are Nescopeck Creek, Little Schuylkill River and Lehigh River near Stoddartsville. Others that might be used at a later date for a further supply are Catawissa, Little Catawissa and Swatara Creeks. In prosecuting the office studies reservoir sites were selected and calculations made of capacities, drainage areas, etc. All of this information is presented in this report.

In considering the item of cost, the Commission finds that the price now charged for water is high because of inadequate supply and difficult topography, which brings about unusual pumping requirements. Under the plans set forth by the Commission, water could be delivered wholesale to consumers probably at a price generally lower than rates now charged. The sources considered would assure an adequate supply at a cost which the distributors would be justified in incurring. It is suggested that a supply project could be built and operated by a "municipal water district."

Within the territory named are the important towns of Hazleton, Pottsville, Mahanoy City, Shenandoah, and Shamokin, and numerous small boroughs and villages. They must have a sure and increasing supply of water. The Commission points out that because of the limited sources now available, and the danger of their becoming polluted or all water rights being taken up or other uses made of streams, rendering it more difficult and costly to obtain them as the years go by. it is urgent that steps be taken immediately to assure an adequate and proper supply.

PROGRAM OF THE HYDROGRAPHIC SERVICE OF THE STATE—CHAPTER III

The Commission submits in Chapter III a program of the hydrographic service of the State, so that there may be exercised an intelligent control in dealing with problems of domestic and commercial water supply, navigation, flood control, steam power development, water power, industrial water supply and flood warning. This program, in attempting to foresee future demands upon the waters of the State and furnishing the information needed to meet these demands, will form the basis for a sound policy for the hydrographic service of the Commission.

Of the natural resources in a State, that represented by water is probably the most important. There may be abundant supplies of valuable minerals but without an adequate supply of water, development of the State will be retarded.

The State of Pennsylvania is fortunate in that the supply of water from precipitation is sufficient to meet the needs of crop production. Consequently, it does not have to contend with some of the acute problems faced by States in the arid regions of our country. Problems no less important, however, are met and must be solved when new sources of water-supply are demanded by rapidly growing municipalities, when additional water supply is required by industrial enterprises, when studies of possible water power developments are undertaken, or when the property and lives of inhabitants in the valley of a stream are endangered by severe floods. The dearth of stream-flow records in the past has been a handicap in the study of many problems in the solution of which the discharge of streams plays an important part.

In order that such problems may be studied in an intelligent way, it is essential that there should be made available an inventory of the water resources of the State. The extent of most natural resources can be determined in a comparatively short time, but, unfortunately, this is not true in determining the extent of available

water supplies, the investigations for which must extend over a period of years. The nature of this problem is such that it is the duty of the State to conduct the work.

The program to be followed should be based on a sound policy. Such a policy is one whereby the State endeavors to keep in closest possible touch with present and proposed industrial developments in order that records may be collected on those streams which may be utilized first. While a growing municipality may have an adequate supply of water to meet its immediate needs and those for several years to come, it may be clear that in the future additional sources of supply will have to be found. Stream-flow records are, therefore, collected on such streams which might later be considered as possible sources for future supply.

A thriving and prosperous district, not yet densely populated, may be traversed by a stream, the waters of which are indispensable for the industrial development of the district, while because of severity of floods, it may be the source of grave concern to the people in that district. In such cases it is the aim to collect hydrographic data relative to that particular problem, and if the later conditions should become acute and demand immediate solution, those delegated to investigate the situation would find data already available for making an intelligent study.

While present possibilities for water-power development may appear to be limited, improved methods of hydro-electric development, and possible decrease in use of coal as a basis of production of power, may open a field for future extension of hydraulic development. Collection of records for the most promising streams is, therefore. continued so that development of hydraulic power, if made at all, may be done to the best possible advantage.

STREAM GAGING, FLOOD WARNING AND PRECIPITATION—CHAPTER IV

The Commission submits in Chapter IV an outline of stream flow conditions and stream gaging in Pennsylvania during the two "water years" ending September 30, 1918, with a general resume of the floods which occurred in Pennsylvania during 1917 and 1918. This chapter also contains tables showing daily, monthly and annual amounts of precipitation observed at the Commission's stations.

HYDROGRAPHIC DATA FOR THE WATER YEARS 1916-17 AND 1917-18—APPENDIX I

In Appendix I will be found hydrographic data for the "water years" 1916-17 and 1917-18, including for each gaging station a de-

scription of the station, a table of daily mean gage heights, and where discharge is available, a list of current meter discharge measurements and tables of daily and monthly discharges.

PYMATUNING RESERVOIR PROJECT—APPENDIX II

A report by Mr. Frederic P. Stearns, Consulting Engineer, containing a review of the hydrographic data and the determination of the minimum discharge which may be maintained in the river, at Sharon, by the operation of the proposed Pymatuning Reservoir, and a review of matters relating to the feasibility and design of the proposed Pymatuning dam, is published as Appendix II of this report.

Owing to the importance of Mr. Stearns' investigations and their direct bearing upon the industrial development in the Beaver and Shenango Valleys, in Western Pennsylvania, it was deemed advisable to publish the report for general distribution.

The Act of the General Assembly approved the 25th day of July, 1917, entitled:

> "An Act making an appropriation to the Water Supply Commission of Pennsylvania to continue the work upon the Pymatuning Swamp Reservoir, commenced under the provisions of an act approved the twenty-fifth day of July, one thousand nine hundred and thirteen, entitled 'An act providing for the erection of a dam at the outlet of Pymatuning Swamp, and the establishment of a reservoir to conserve the waters thereof; providing for the taking of land and materials necessary thereto; vesting certain powers and duties in the Water Supply Commission; and making an appropriation,' and the act amendatory thereof, entitled 'An act to amend an act, entitled "An act providing for the erection of a dam at the outlet of Pymatuning Swamp, and the establishment of a reservoir to conserve the waters thereof; providing for the taking of land and materials necessary thereto; vesting certain powers and duties in the Water Supply Commission; and making an appropriation," approved the twenty-fifth day of July, Anno Domini one thousand nine hundred and thirteen; amending sections four and eight of said act; providing for the payment of the necessary compensation for waivers of damages from owners of lands in the State of Ohio which will be submerged or injured by the construction of such reservoir; and making an appropriation for the erection of such dam and the establishment of such reservoir,' approved the eighteenth day of June, Anno Domini, nineteen hundred and fifteen. (Appropriation Acts, page one hundred and ninety-six)."

amending the Pymatuning Swamp Reservoir Project Act, by providing that:

> "No portion of the seven hundred thousand dollars ($700,000) appropriated by this act shall be available, until the Common-

> wealth of Pennsylvania has full power and authority to submerge lands in the State of Ohio necessary for the establishment and maintenance of the reservoir to conserve the waters of Pymatuning Swamp; nor shall any money hereby appropriated be available, until the title to all property located in the State of Ohio and necessary, in the opinion of the Water Supply Commission of Pennsylvania, to be acquired for the erection and maintenance of said dam and reservoir, has been transferred, clear of all incumbrances, to the Commonwealth of Pennsylvania."

This mandate of the act not having been complied with the Commission could do nothing in the way of acquisition of land, etc., in Pennsylvania, necessary for the consummation of the project, but did, under Section 2, of the Act of 25th day of July, 1917, revise its estimate of the cost of the project, based upon an appraisal of the value of the lands and buildings and estimates of the construction features pertaining to the erection of the dam and preparation of the reservoir site. The investigations in field and office have been continued in order to have thorough knowledge of the conditions affecting the supply to and draft from the storage reservoir, and to become familiar with the streams to be regulated and the influences of the large tributaries below the reservoir. The eleven rainfall and seven stream height stations have been maintained, the detailed information concerning which is published in Appendix No. 1 of this report, under Hydrographic Data.

The construction of a dam about 1,500 feet long, of an average height of 27 feet across the Shenango River at the outlet of Pymatuning Swamp, would create a reservoir with a capacity of about 62,000,000,000 gallons. This lake would have an area of 25.68 square miles, or 16,420 acres.

Topographical surveys have been made of the lands within and surrounding the reservoir site comprising 23,270 acres, or 36.4 square miles. The boundaries of the several parcels of land within this area have likewise been determined and information obtained on the work involved in clearing the reservoir site, including the surveys of the outlines of timbered portions, and the estimated amount of merchantable timber.

A tentative taking line has been drawn on the property maps around the limits of the reservoir. Care has been taken in plotting this line not to include an unnecessarily large amount of property, nor, on the other hand ,to make the taking line unduly crooked, and in no case to cut a farm so as to leave the part not taken without an outlet. Entire parcels have been included within this line where nearly the whole of the farm would be submerged.

During the latter part of 1916 and early in 1917, the foundation of the proposed dam was investigated. Test pits were dug and boring operations carried on to locate bed rock and to explore and test the underground conditions of the formation overlying the rock. Results of these operations indicate that a safe dam can be constructed at the site selected, without appreciable loss from the reservoir through leakage, at a reasonable cost.

The Commission has compiled a comprehensive report of progress on the Pymatuning Swamp Project, which report is in manuscript form on file in the office of the Commission. It is more than a mere technical report of progress. It contains information relating to droughts and floods, and the possibilities of flood control in the Shenango and Beaver Valleys. The report sets forth details of the work of the Commission in preparing for the construction of a storage reservoir at the outlet of the Pymatuning Swamp, in Crawford County, which will regulate the flow of the Shenango and Beaver Rivers, and will prevent severe droughts and floods.

It furnishes data concerning hydraulic investigations of supply for, and demand upon, the reservoir, selection and exploration of dam site, extent and capacity of storage reservoir required, and location of land and properties within the reservoir site.

In addition to this data, the report contains plates explanatory of the text and illustrations showing the swamp and the proposed dam and reservoir site, and depicts droughts and floods in and along the streams.

LAWRENCEVILLE DIKE—TIOGA COUNTY, PENN'A.

The Commission, under the provisions of an Act of the General Assembly, entitled:

> "An act to authorize the Water Supply Commission to build a dike or dikes for the protection of property in the Borough of Lawrenceville, Tioga County, and making an appropriation therefor,"

approved the 25th day of July, A. D. 1917, (see Appropriation Acts of 1917—page 187), was authorized to construct a dike or dikes along the banks of the Cowanesque River, in the Borough of Lawrenceville, in Tioga County, so as to prevent the destruction of property in said borough.

The following is a copy of the Act:

> "Section 1. Be it enacted, &c., That the Water Supply Commission of Pennsylvania is hereby authorized to construct a dike or dikes along the bank of the Cowanesque River, in Tioga

County, so as to prevent the destruction of property and to discontinue and prevent the overflow of lands in said borough.

"Section 2. The work herein authorized shall be done in accordance with the plans, specifications, and estimates to be furnished by, or submitted to and approved by, the Water Supply Commission of Pennsylvania.

"Section 3. No work shall be done or money expended for the purpose named in this act, until the owners of the lands upon which such dike or dikes shall be built shall have filed with the Water Supply Commission of Pennsylvania an instrument in writing granting to the State the right to erect and forever maintain the dike or dikes aforesaid, and releasing the State from all damages which may have accrued up to the date of execution thereof by reason of the overflow of such lands, and nothing in this act shall be construed as a recognition or assumption of any liability on the part of the State for any damages done by the overflow of said river.

"Section 4. The sum of five thousand dollars, or so much thereof as may be necessary, is hereby specifically appropriated for the purposes aforesaid in this act; to be paid by the State Treasurer upon the warrant of the Auditor General, on requisition of the Water Supply Commission of Pennsylvania."

The instrument in writing required by the third section of the Act to be filed with the Commission before any work could be done or money expended, was duly received, and is on file in the office of the Commission.

Two efforts were made by newspaper advertisement to interest prospective bidders with a view of securing proposals for doing the work in accordance with the plans, specifications and estimates furnished by the Commission, but no bids were received as a result of such advertisement.

It appearing, because of the inability to secure bids, that the only other plan remaining was for the Commission to do the work itself, the Engineering Division accordingly was directed to prepare a report recommending the best plan for performing the work. A copy of this report made as a result of an examination at the site of the proposed work, which is self-explanatory, was submitted to the Attorney General with the request that he advise the Commission, in view of the language contained in the second Section of the Act, which reads as follows:

> "Section 2. The work herein authorized shall be done in accordance with the plans, specifications, and estimates to be furnished by, or submitted to and approved by, the Water Supply Commission of Pennsylvania,"

whether or not there was any objection, legally or otherwise, against the Commission undertaking to perform the work. As a result of

this inquiry, the Attorney General, under date of September 5th, 1918, advised the Commission that:

> "In view of the fact that the Commission has twice made efforts by newspaper advertisement to interest prospective bidders and secure proposals for doing the work, in accordance with the plans, specifications and estimates furnished by the Commission, but has received no bid as the result of such advertisement, I am of opinion that under the language of the first section of the Act "the Commission can have the work done under the supervision of one of its assistant engineers, securing labor, teams and material directly for the work, provided you are satisfied that the work can be completed within the appropriation of five thousand dollars made in said Act. Unless you are reasonably certain on this point, the work should not be undertaken."

The work of constructing a dike or dikes along the banks of the Cowanesque River, in Tioga County, so as to prevent the destruction of property by the overflow of the banks of the Cowanesque River in Lawrenceville Borough during floods, was undertaken by the Commission on September 9th, 1918, and completed on December 12th, 1918.

The Borough of Lawrenceville is built on low land confined within the angle formed by the confluence of the Cowanesque and Tioga Rivers. Owing to its peculiar topographical position, the town has been subject to inundation from both rivers during floods, and dikes were built along the streams about 20 years ago, each about a mile and a half in length. The Cowanesque dike was badly damaged and breaches washed through it by the flood in June, 1916, and it was for the purpose of repairing, raising and strengthening the dike that the appropriation was made.

The dike as completed by the Commission is 4,960 feet long in Pennsylvania, and has an average height of 4.5 feet. The top width is 4 feet and the side slopes 1 on 2, which were seeded to grass. The elevation of the top of the dike was raised 2 feet above that of the 1916 flood and the section increased over that previously existing.

The unexpended balance remaining from this appropriation will be available to make any repairs needed in the Spring of 1919, in case any part of the new embankment is injured by the spring floods.

PROPOSED JOINT PROJECT FOR REGULATING THE DISCHARGE OF THE SHENANGO AND BEAVER RIVERS AND SUPPLYING WATER FOR THE LAKE ERIE AND OHIO RIVER CANAL—APPENDIX III

A report by Mr. Frederic P. Stearns, Consulting Engineer, upon a proposed joint project for regulating the discharge of the Shen-

ango and Beaver Rivers and supplying water for the Lake Erie and Ohio River Canal, is published as Appendix III of this report.

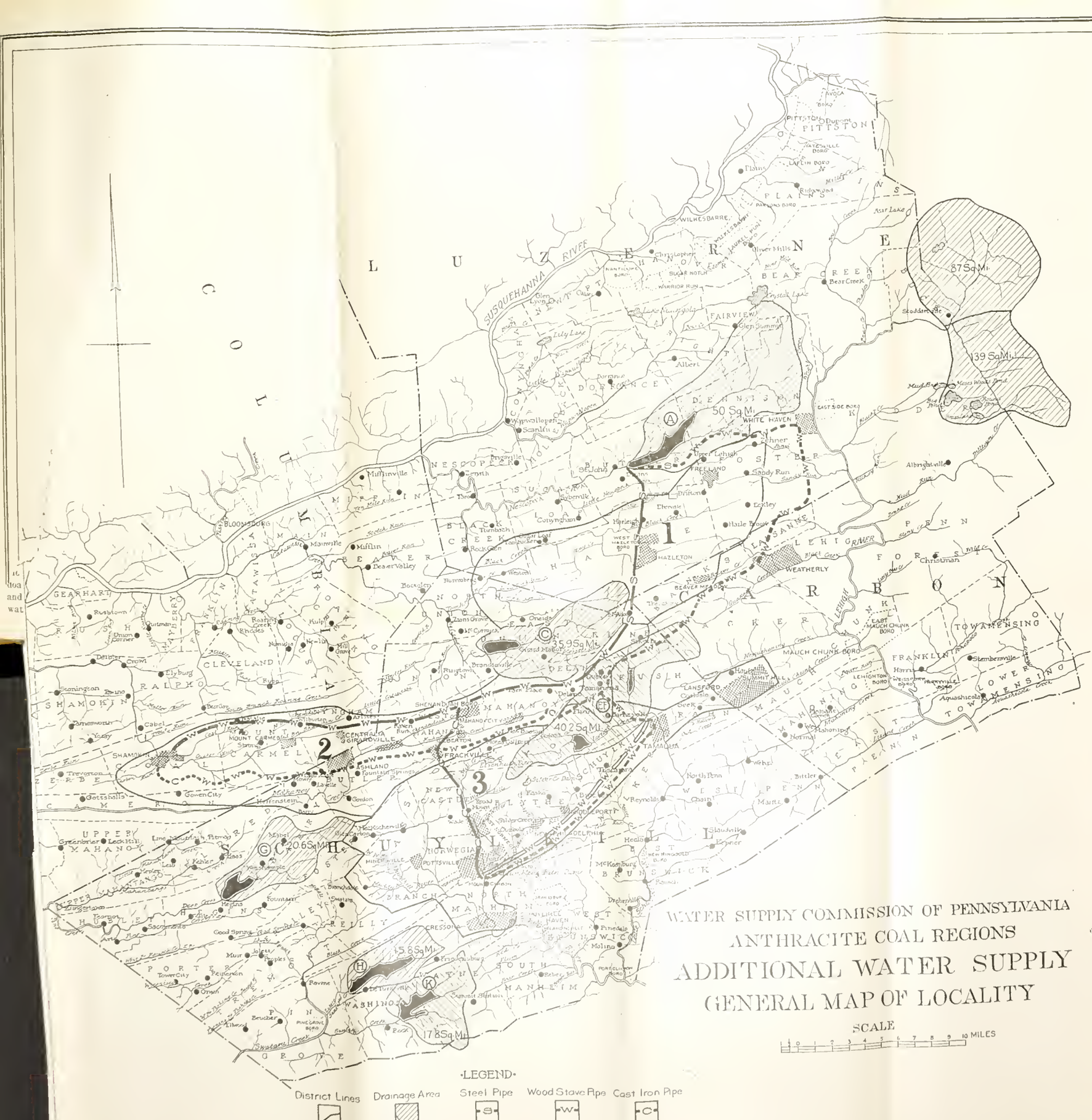
This study was made for the purpose of determining upon the feasibility and adequacy of the proposed joint project of building the Pymatuning Reservoir of sufficient size to regulate the Shenango and Beaver Rivers and to bring a supply of water from French Creek into an enlarged Pymatuning Reservoir for the purpose of supplying the summit level of the Lake Erie and Ohio River Canal. This report indicates that French Creek, in connection with this enlarged reservoir, is by far the best source of supply for the canal, and, in all probability, there may be no other practicable source or sources for furnishing the full quantity of water which would be needed if the canal were to have a large amount of traffic. The preliminary studies also indicated that the large amount of storage made available by raising the Pymatuning Reservoir 12 feet above the height necessary for the regulation of the Shenango and Beaver Rivers, in connection with an adequate supply from French Creek, would be sufficient for all the requirements of the canal for a long time in the future without drawing water for the canal from any other source, except, of course, those which naturally discharge into the canal or into the feeder leading from the Pymatuning Reservoir to the canal, thus making unnecessary to consider other sources which might be available to supplement the supply of the canal.

The feature which stands out most prominently as a result of the investigation is that if the two projects under consideration are to be carried out, there should be co-operation by those in charge, and that it is very desirable, if not essential, that the supply of water for the Lake Erie and Ohio River Canal should be chiefly French Creek water stored in the enlarged Pymatuning Reservoir. If the additional works for the purpose are sufficiently ample, the regulation of the Shenango and Beaver Rivers can be more satisfactorily accomplished by a joint works than by independent works, and the estimated cost of the joint project would be much less than the total cost of two independent projects.

The water estimated to be necessary for canal use during navigation season, together with that required for maintaining a discharge of 450 cubic feet per second in the Shenango River at Sharon, can be obtained from French, Mill and Mosquito Creeks if sufficient storage capacity is provided in the Pymatuning Reservoir and elsewhere.

CHAPTER II

ANTHRACITE COAL REGION—ADDITIONAL WATER SUPPLY


WATER SUPPLY COMMISSION OF PENNSYLVANIA
ANTHRACITE COAL REGIONS
ADDITIONAL WATER SUPPLY
GENERAL MAP OF LOCALITY
SCALE
0 1 2 3 4 5 6 7 8 9 10 MILES
·LEGEND·
District Lines
Drainage Area
Steel Pipe
Wood Stave Pipe
Cast Iron Pipe
87 Sq Mi.
139 Sq Mi.
50 Sq Mi.
35.9 Sq Mi.
40.2 Sq Mi.
20.6 Sq Mi.
15.8 Sq Mi.
17.8 Sq Mi.
SUSQUEHANNA RIVER
LUZERNE
COLUMBIA
LACKAWANNA
WYOMING
WILKES-BARRE
PITTSTON
PLAINS
BEAR CREEK
FAIRVIEW
DENNISON
WHITE HAVEN
BLACK CREEK
HAZLETON
WEATHERLY
MAUCH CHUNK
TOWAMENSING
FRANKLIN
LOWER TOWAMENSING
EAST PENN
WEST PENN
NORTH MAHANOY
SOUTH MAHANOY
UPPER MAHANOY
MIDDLE CREEK
BEAVER CREEK
CLEVELAND
RALPHO
SHAMOKIN
GEARHART
MAHANOY CITY
SHENANDOAH
GIRARDVILLE
FRACKVILLE
ASHLAND
CENTRALIA
MOUNT CARMEL
GOWEN CITY
GORDON
MINERSVILLE
PINE GROVE
TOWER CITY
PORT CARBON
PALO ALTO
REILLY
NEW CASTLE
SCHUYLKILL
BRUNSWICK
MANHEIM
WASHINGTON
TAMAQUA
LANSFORD
SUMMIT HILL
LEHIGHTON
MAUCH CHUNK BORO
EAST MAUCH CHUNK BORO
WEISSPORT
NORTHAMPTON
LEHIGH
CARBON
SCHUYLKILL

ANTHRACITE COAL REGION—ADDITIONAL WATER SUPPLY

INTRODUCTION

An inventory of the present water supply throughout the Commonwealth disclosed the fact that of the various sections in which a shortage frequently occurs the middle and southern anthracite coal fields, comprising a region in northern Schuylkill, southern Luzerne, western Carbon, and eastern Columbia and Northumberland counties, are in the greatest need of additional supply. In order to devise a remedy for this condition, which is bound to become more acute as the industries and the population of the section increase, office studies have been made to determine the most pacticable sources for additional supply and methods of delivery to the territory in question. It is not contemplated to replace existing water supply plants, but rather to furnish them with ample water to supplement their present sources, and to make a supply available at places not having such advantages at present. A project of this kind could be built and operated by a "Municipal Water District" (a corporate body representative of the district to be supplied).

Existing reservoirs, intakes, watershed lines and supply mains were plotted on United States Geological Survey topographical sheets to show the present water supply developement. Data was collected on the population and rate of growth, consumption, mode of supply and sources from which future needs were to be met. A reconnaissance map of the surrounding watersheds was used as a basis to determine the available sources of additional supply, methods of delivery and routes for pipe lines. The information thus obtained has been tabulated or diagrammed for ready reference. For the further consideration of the project, field investigation will be necessary.

The field work will include the examination of dam sites and pipe line routes, the verification and amplification of the office data, a study of present supply systems, and the collection of information through interview with citizens and water-works officials. While the field investigation will necessitate a revision of the data at hand, and will result in new estimates and details for the schemes outlined, the present information available will furnish a basis for the solution of the water shortage problem.

The Anthracite coal region in southern Luzerne and northern Schuylkill counties, south of the Nescopeck Valley, extending slightly into Carbon County on the east and into Columbia and Northumberland counties on the west, is a high plateau, some communities being almost at the summits of the mountains. In this region are the industrial centers of Hazleton, Pottsville, Mahanoy City, Shenandoah, Mount Carmel and Shamokin, and numerous small boroughs and villages. Existing water supply systems draw from the headwaters of creeks and from wells. The main streams are so polluted

with culm and mine drainage as to be unsuitable for water supply, thus making it both difficult and expensive to secure good water in large quantities. The five systems supplying Mount Carmel, Centralia, the territory of the Girard Estate, Shenandoah and Mahanoy City are obliged to draw from sources across the mountains, necessitating pumping against heads ranging from 658 feet to 842 feet. For some time past this district has been subject to a serious water shortage during the summer seasons; the press extracts indicate the conditions in time of drought. The boroughs of Shenandoah, Ashland and Tamaqua suffer severely, as do Hazleton and vicinity and the numerous collieries throughout this region.

POPULATION

The territory will be considered as comprising three districts:

District 1 including Hazleton and vicinity,

District 2 extending from Mahanoy City to Shamokin,

District 3 comprising Pottsville and vicinity.

The total population of the three districts in 1910, as shown by Tables Nos. III to VI, was about 300,000. During the decade from 1900 to 1910 these districts showed a growth of 21 per cent, 14 per cent and 37 per cent respectively, the average increase for the entire territory being 22 per cent. The growth has been uniform for the past 20 years in the first two districts, but in the third district there was a marked increase in the period from 1900 to 1910 over that of 1890-1900, the gain for the earlier period being 16 per cent, as against 37 per cent for the later period.

In considering the future water requirements for an extensive district such as this, a period of 35 years is none too great for which to plan, and this period has been adopted as the limit of present estimates. For the year 1950 it is estimated that the population of the three districts will be between 600,000 and 800,000, the former figure being based on a straight line or arithmetical increase and the latter on a geometrical rate of increase. It is a matter of conjecture as to how long the coal deposits will hold out, but a minimum limit of 100 years is a conservative estimate. With the increasing rate of industrial growth of the country at large, demanding corresponding power increase, it is reasonable to assume that there will be a steady growth of the coal industry and population which will probably exceed a straight line rate. An ample supply of good water is necessary, not only to maintain present industries but to encourage the establishment of new ones and render the community a more desirable place of abode.

CONSUMPTION OF WATER

Table No. III, showing the present and estimated future consumption in the three districts, indicates that the safe yield of the pres-

ent sources for a series of dry years is less than the present consumption, and so bears out the statements and reports as to the inadequacy of the existing works. It is estimated that in 1950 there will be required 90,000,000 gallons daily, about 49,000,000 gallons per day more than the present average consumption and 55,000,000 gallons more than the present sources, as now developed, can be relied upon to yield in a severely dry season. This is, moreover, based upon the assumption of a stationary per capita consumption but it may be greater than this, since experience has shown it to be practically universal that the per capita figure increases with the increase in population. Curves of estimated population and consumption are shown on Plate A.

By another method of predicting the future consumption of water, the future daily coal output was estimated on the basis of straight line increase at the rate occurring from 1903 to 1913 and the amount of water estimated from that now used per ton of coal mined. This indicates about 51,000,000 gallons per day. If to it be added an allowance of 75 gallons per capita for domestic and miscellaneous industrial consumption, or 45,000,000 gallons for the lowest estimate of 600,000 population, the total consumption in 1950, on this basis, would be 96,000,000 gallons per day, or 62,000,000 gallons in excess of the safe yield of present developments.

EXISTING WATER SUPPLIES AND POSSIBILITY OF ADDITIONAL DEVELOPMENT

Table No. III indicates that it may be possible, by further development of storage on existing watersheds, to secure an additional water supply of 20,000,000 gallons daily, but if this could be done it would probably be at great expense. Perhaps half the amount stated might be developed at moderate cost. Table No. VII gives the essential details of each existing water system. From the foregoing facts it is apparent that additional water must ultimately be secured for this region, and since this is the case it would probably be more economical to develop the new supply at an early date rather than make expenditure on costly works for further development of numerous small local sources.

Table No. VIII shows the largest systems and the approximate amount of water used by each. It shows that over 25 per cent of the entire consumption is in systems controlled by the Lehigh Valley Coal Company and the Philadelphia and Reading Coal and Iron Company, each of which has also private water supply systems at certain collieries and controls a large share of the water rights in this region.

PRESENT COST OF WATER

Table No. IX shows the prevailing wholesale water rates of the various systems now supplying these districts. It will be noted that

in the Hazleton and Mahanoy City districts the lowest rate per 1,000 gallons is 10 cents, except in the system of the Anthracite Water Company, owned by the Philadelphia and Reading Coal and Iron Company and supplying largely its mines. In this system the supply is by gravity and the rates range as low as 3 cents for amounts over 50,000,000 gallons per month, the water being used largely by the owners of the system. When the supply from these sources is exhausted and pumping must be resorted to (in fact the time is already at hand in District 2), the cost of delivering the additional water will equal or exceed that of other systems.

The annual report of the Girard Water Company for 1912 says:

> "The water agreements of the Girard Water Company have heretofore been in two forms, one of which provides for a rate of five cents per 1,000 gallons for the first million gallons in each month and ten cents per 1,000 gallons thereafter, the minimum charge being $50 per month, and the other for a flat rate of ten cents per 1,000 gallons for all water used. The more water that is used in excess of one million gallons per month in each case under the former agreements, or the larger the proportion of the total consumption that is covered by the flat rate agreements, the higher the average price for all water supplied. As the cost of supplying water will be materially increased by the necessity of pumping from the new sources of supply, which will be begun during 1914, no agreements will hereafter be made or renewed except at a flat rate of ten cents per 1,000 gallons."

In the Pottsville district it will be noted that the rates are lower, ranging from 5 to 8 cents, except in the case of the systems controlled by the Philadelphia and Reading Coal and Iron Company, which range from 3 to 5 cents.

With the existing scarcity of supply necessitating expensive pipe lines, pumping plants, etc., it may be expected that these rates will gradually increase, as indicated by the experience of the Girard Water Company.

SOURCES OF ADDITIONAL SUPPLY CONSIDERED

The entire territory surrounding the districts in question has been studied to find possible sources for additional supply. Reservoir sites on a number of streams have been selected and calculations of capacities, drainage areas, etc., have been made, the results of which are shown in Table No. X. The most promising sources of supply are Nescopeck Creek, Little Schuylkill River and Lehigh River near Stoddartsville. Other sources which might be used at a later date for a still further supply are Catawissa, Swatara and Little Swatara creeks.

NESCOPECK CREEK

The dam site selected, designated "A" on the General Map, is about three-quarters of a mile east of Drums village, Butler Town-

ship, Luzerne County, about five and one-half miles in an air line north of Hazleton, across the Buck Mountain divide and about a mile upstream from the crossing of the Wilkes-Barre and Hazleton Railway electric line. The watershed area is about 50 square miles, very sparsely settled, considerably wooded, and, so far as is known, uncontaminated. A dam 66 feet high and 1,550 feet long, giving a maximum depth of water of 56 feet, would form a reservoir about 6 miles long, containing approximately 11,000,000,000 gallons. This would be a storage of 220,000,000 gallons per square mile of watershed from which a safe yield of from 700,000 to 800,000 gallons per square mile per day should be obtained, or a total safe yield of from 35,000,000 to 40,000,000 gallons per day. This would be the limit of economical development. In order to deliver the water into the districts where it is required, it must be pumped by one of two alternate routes against heads (including friction losses) of 810 and 435 feet respectively. The actual difference in elevation between low water and the mountain summit on these lines is 760 feet and 420 feet respectively. These routes will hereafter be designated as "High Lift" and "Low Lift".

The "High Lift" route, profile of which is shown on Plate B, extends directly south over Buck Mountain, passes centrally through District 1, about one mile west of Hazleton, thence westerly, one branch traversing District 2 to Shamokin and another turning south through the center of District 3 to Pottsville. Under this plan all places except Freeland could be served without further pumping, while some places would have to reduce pressures.

The "Low Lift" route, shown in profile on Plate C, passes easterly over Green Mountain and then, after circling in a southerly direction around the outside of District 1, divides, one branch entering District 2 by tunnel and extending through it to Shamokin, while another branch enters District 3 at the easterly end and extends along its southerly borders to Pottsville. The line crosses near, and could deliver to, two pumping plants of the Wyoming Valley Water Supply Company, which now supply Drifton and Hazleton. Under this plan about one-third of the total consumption must be repumped by local plants.

The length of the "High Lift" line from the reservoir to Shenandoah is 22 miles, the branch to Shamokin is 20 miles, and the branch to Pottsville is 11½ miles, making a total of about 54 miles. A supplementary supply from the Little Schuylkill River would add 17½ miles. The length of the "Low Lift" route from the reservoir to the point where it divides is about 35 miles, the branch through District 3 to Shamokin is about 30 miles, and the branch to Pottsville is about 21 miles, making a total of 86 miles.

LITTLE SCHUYLKILL RIVER

An intake, designated "EF", has been assumed at the junction of Locust Creek with the Little Schuylkill River, about two and one-half miles upstream from Tamaqua, with a watershed area of approximately 40 square miles. Two reservoir sites have been selected, one on the Little Schuylkill River, with a dam just above the crossing of the Central Railway of New Jersey, designated site "E", and another on Locust Creek, with a dam, designated as "F", about three and one-quarter miles west of and above the mouth of the creek. These reservoirs have watershed areas of 18.5 and 9.1 square miles respectively, leaving about 12 square miles without developed storage on account of the prohibitive cost of reservoir sites occupied by railroads. At Site "E" a dam, 100 feet high and 1,100 feet long has been assumed, giving a storage of 3,500,000,000 gallons or 188,000,000 gallons per square mile. At Site "F" a dam, 70 feet high and 1,240 feet long has been assumed, giving a storage of 1,700,000,000 gallons or 187,000,000 gallons per square mile. These probably also represent the limit of economical development. For the entire watershed there would be a storage of 130,000,000 gallons per square mile, corresponding to a safe yield of 600,000 gallons per square mile per day, or a total of 24,000,000 gallons per day. Probably this watershed is more liable to contamination than that of the Nescopeck Creek, because of its being traversed by a number of railroad lines and possibly receiving some mine drainage.

The water would be drawn from reservoirs "E" and "F" into the natural stream channels, and would be pumped at intake "EF" against a head of about 230 feet through a pipe line extending westerly through District 3 to Pottsville, along the side of Locust Mountain, passing about a mile north of Tamaqua and westerly through Middleport, along the northerly slope of Sharp Mountain to Pottsville, a total length of about 17½ miles. Plate B shows the profiles over this route.

CATAWISSA CREEK, SITE "C"

There is, apparently, a good reservoir site near Brandonville, about 4 miles north of Shenandoah. A dam, 110 feet high and 1,000 feet long would impound about 5,800,000,000 gallons, giving a storage of about 160,000,000 gallons per square mile, corresponding to a total safe yield of 27,000,000 gallons daily. The water would have to be pumped against about the same head as under the "High Lift" proposition of Nescopeck Creek, but the distribution to the various districts would be somewhat more complicated.

The watershed area is about 36 square miles and is also sparsely settled, but probably somewhat polluted by mine drainage and hence would require filtering. For these reasons it has not been considered as an immediate source of supply. It might be advantageously developed as a supplementary supply to Nescopeck Creek.

LEHIGH RIVER

It is believed that a dam site could be found near Stoddartsville either just below the junction of Tobyhanna Creek, with a watershed area of about 226 square miles, or above the junction of either of these two streams; if so, a gravity supply of greater amount than any of the other sources could be obtained. The pipe line from this source would be approximately the same length as that of the "Low Lift" route from Nescopeck Creek, and in fact the two routes would be identical after the first 14 miles (See General Map, also Profile on Plate C). Under this scheme pumping would be unnecessary, except to meet local conditions, and it is possible that investigations may prove this to be a better and cheaper source than any other.

SWATARA CREEK

There are two reservoir sites on Little Swatara and Swatara creeks, Washington Township, Schuylkill County, having a combined watershed area of about 33 square miles, on which, by constructing dams of 50 and 49 feet in height, respectively, a storage of about 220,000,000 gallons per square mile could be obtained, corresponding to a total safe yield of about 25,000,000 gallons. The low water elevations of these reservoirs would be 560 and 615 feet, respectively, thus requiring a lift of between 500 and 600 feet. These may, at some future date, be desirable sources of supply for District 3, the length of pipe line being only about 16 to 18 miles.

YIELD OF WATERSHEDS

On Plate E, curves are shown for the estimated safe yield according to the extent of storage development for the Sudbury and Croton watersheds, the figures for these curves being taken from diagrams in the report of John R. Freeman on the Water Supply for New York City. This sheet also shows the curve for estimates in our studies.

The rainfall map in the 1908 annual report of this Commission indicates that the probable rainfall on the watershed above the proposed dam site on Nescopeck Creek averages 42 inches, whereas the average for the Croton watershed is about 49 inches and for the Sudbury watershed it is about 46 inches, the latter having a run off of 49 per cent, which is slightly higher than that of the Croton watershed.

ALTERNATE SCHEMES

From detailed studies of the Nescopeck and Little Schuylkill projects the following schemes of supply from these two sources are submitted:

1-a Nescopeck Creek—"A"—High Lift Route, supply to all three districts.

1-b Nescopeck Creek—"A"—High Lift Route, and Little Schuylkill River—"EF", each source developed simultaneously. During first 30 years "EF" supplying Dis-

trict 3 and "A" supplying Districts 1 and 2. Thereafter District 3 to draw from "A" also.

2-a Nescopeck Creek—"A"—Low Lift Route, supplying all three districts to limit of yield, supplemented when required by "EF".

2-b Same as 1-b, except "Low Lift" route from "A".

The various constructive features, including works for the collection, conveyance and distribution of water, are dealt with under an "Assumed Schedule of Development," which is outlined in Table No. XII. It is obvious that it would not be rational to construct an initial plant of full ultimate capacity, as this would involve the paying of interest and maintenance costs on a considerable portion of the plant that would be deteriorating without serving any useful purpose in the meantime. Although the total ultimate outlay on a plant built complete in the beginning would be less than on one built piecemeal, the cost of water in the earlier years under the former method of development would be prohibitive. Preliminary to the working out of the "Assumed Schedule of Development", Plate D, was designed to show, by table and diagram, the assumed periodic supply requirements at the various centers of distribution, from which the capacities of the successive pipe-line installations and reservoirs were determined. In all these studies the development of the system is assumed to begin in 1915, so that when this project is carried out revisions will be necessary.

WATER COST STUDIES

The Schedule of Development of the Nescopeck and Little Schuylkill supplies, Table No. XII furnishes a basis for estimating the costs. These costs would, of necessity, require considerable revision if the supplies were to be developed under present conditions. On the basis of the foregoing schedules the cost of water per 1,000 gallons was calculated. This cost is composed of two elements, namely: (1) cost of electric power for pumping, and (2) fixed charges, cost of operation and maintenance. The former is practically uniform, while the latter varies from one period to another, gradually decreasing as the quantity of water furnished increases.

The results of these estimates are shown in Table No. XI, and indicate that the cost per 1,000 gallons of water delivered, including interest on investment and depreciation charges, will vary from about 3.3 to 8.5 cents, according to the source of supply from which water is taken, the quantity delivered and districts to which delivered. For the supply from Nescopeck Creek, via "High Lift" route, to Districts 1 and 2, and ultimately District 3, Scheme 1-b, the price will vary between 6.0 and 8.5 cents, the higher figure being used on a delivery of 8,000,000 gallons per day and the lower on a delivery of 40,000,000 gallons per day. For the "Low Lift" route, Scheme 2-b, the price per 1,000 gallons delivered to the local system is 1.0

cent less at the beginning of the period and nearly 1.5 cents less toward the end of the period. In order to make a fair comparison, however, the increased cost of local pumping, where required, must be added, and this brings the difference down to 0.2 cents and 0.5 cents respectively. If the supply from "A" were delivered via "Low Lift" route simultaneously to all three districts, the first cost, including local booster service, would be reduced to approximately 6.2 cents. For the "High Lift" route it would be about 0.4 cent higher. For a supply from the Little Schuylkill River to District 3, to the extent of its capacity, 24,000,000 gallons, the price will vary from 3.3 to 5.8 cents for deliveries of 24,000,000 to 5,000,000 gallons respectively.

In all cases, at the very beginning, when only a small amount of water may be pumped, the actual cost of the water would be considerably higher than that given above, but it is likely that the quantity upon which the first price is based would be required in a comparatively short time. The figures given include depreciation, as before stated, but do not include sinking fund charges, which, if considered, would add from 0.3 to 0.8 cent, according to period and scheme considered.

The cost of Neshopeck Creek water is higher than that of the Little Schuylkill River because it must be distributed over a much greater territory, requiring larger pipe-lines, and partly because much of the territory stands at a higher elevation and hence requires pumping to greater heights. The "High Lift" route necessitates pumping the entire volume to an extreme height in order to pass it over the intervening mountain plateau, although a considerable portion of the water is destined for sections which could be served with a much smaller lift. While the "Low Lift" route overcomes the latter condition, its advantages are partly dissipated by the cost of its more circuitous, hence longer, route. The Little Schuylkill project, on the other hand, requires only a comparatively small lift, and the element of cost, due to pumping and short pipe line, is materially reduced.

The analysis indicates that instead of a uniform decrease in cost with an increase in delivery, as might be expected, there is an intermediate fluctuation. This is due partly to the assumption of a fairly high consumption at the very beginning (owing to demand being in excess of safe yield of existing sources), while the amount of increase after the first period is less in proportion to the corresponding expenditure, so that the relation of quantity of supply to total fixed charges is greater at the beginning than at the subsequent period, thus tending to keep the first cost lower than otherwise. Another element is that, in an analysis, the periodic additions to the plant are lumped at intervals, whereas in actual development such construction must be arranged more uniformly. The whole matter is based on arbitrary assumptions which will, of course, be modified as

further field investigations are made. It is believed, however, that with the care taken to make the calculations clear, the essential points will be plainly brought out, and that the work done should be of considerable value whenever investigations and study may be continued.

No allowance has been made in the cost estimates for purification of the water, because, from the information at hand, it seemed probable there was no serious contamination of the sources considered and that no other treatment might be necessary than the application of hypochlorite of lime.

In the case of the Little Schuylkill and Lehigh rivers some provision would probably have to be made to allow a certain minimum flow to pass the reservoirs so as to avoid any reduction in stream flow in connection with the operation of the canal below on these two streams.

PROPOSED INDEPENDENT DEVELOPMENT

The Philadelphia and Reading Coal and Iron Company controls extensive water-rights on the Little Schuylkill watershed and has already planned a system of supply from it into District 2. This involves pumping against a high head not far different from that required at the Nescopeck site and would undoubtedly cost as much as, or more per 1,000 gallons than estimated therefor. In a broad scheme of supply, such as is now being considered for the entire region, this source is much better adapted to the supply for the Pottsville district because of the comparatively low lift and the resulting low cost of delivering the water. Looked at solely from the viewpoint of the company the scheme it proposes is a natural one, because there is opportunity for considerable further development of local sources in the Pottsville district and the great immediate need for water to supply the company's mines is in this middle, or No. 2, district. If, however, a general scheme of supply for the whole region were to be developed in the near future, whereby all interests concerned would draw from the system, the entire aspect of the matter would be changed and the Little Schuylkill source should be used as contemplated in this study.

CONCLUSIONS

The general conclusions resulting from the foregoing studies are as follows:

(1) The water supply of the territory under consideration is inadequate, and a general scheme for an adequate supply should be developed so that the present and future water requirements may be met. This is a public service that should not be delayed if the development of this section is to continue.

(2) There are no available sources within the territory, thus making it necessary to go outside, where pumping will be required to a certain extent whatever sources may be developed.

(3) The price charged for the water in these districts is high because of inadequate supply and difficult topography, bringing about unusual pumping requirements, except in the case of the Philadelphia and Reading Coal and Iron Company systems, which have been able to acquire and develop sources in which the water is delivered by gravity. The time, however, has come when this company must begin to adopt pumping for a portion of this territory.

(4) Water can be delivered wholesale to the various corporation and municipal systems from the sources described probably at a price generally lower than the wholesale rates now charged in these regions. With few exceptions, these corporation and municipalities could probably purchase the water and distribute it at a profit without the necessity of increasing rates. The sources considered would afford an adequate supply at a cost that the distributors would be justified in incurring.

(5) Because of the limited sources now available for the supply of this region, and the danger of their becoming polluted or all water-rights being taken up or other uses made of the streams, rendering it more and more difficult and costly to obtain them as the years go by, it would seem urgent that steps be taken immediately to assure a proper and adequate supply.

PRESS ARTICLES AND EXTRACTS FROM REPORTS INDICATING CONDITIONS OF WATER SHORTAGE IN ANTHRACITE COAL REGIONS IN 1914.

READING COLLIERIES IMPOUND DAMS.

Philadelphia Record, October 11, 1914.

Pottsville, Pa., October 11. In order that the drought, which gets more severe in the coal region every day, shall not cause the closing down of its collieries, the Reading Coal and Iron Company has impounded the water in the Big Tumbling Run dams, which comprise the headwaters of the Schuylkill Canal.

This move will affect Manayunk mills, as there will be no water in the dams to flush the canal if the mills need the water. Under the charter the company is required to release water from the dams when the mills require it, but the Reading officials say they hope this will not be required of them, as the water is urgently needed in this section and one of the dams is already empty.

A score of collieries in this county have but two days' water on hand, and, unlike the Reading Company, are in no position to haul it.

PROTEST AGAINST SHORTAGE OF WATER ON DUTCH HILL.

Tamaqua Evening Courier, October 23, 1914.

About twenty-five citizens of the upper end of Union Street, Dutch Hill, came down en masse on Tuesday to protest to the Water Commission against the shortage of water in the upper end. They complained that they have not had water since late Friday afternoon.

Water Commissioner J. M. Harris met the committee, and, when he learned that there had been no water on the hill for several days, immediately got in communication with Superintendent Reeser, who shut off several sections of town so that the water could be forced up Dutch Hill.

The Owl Creek dam is practically empty, which accounts for the lack of pressure on the high points of town.

SHENANDOAH WITHOUT WATER.

Tamaqua Evening Courier, October 23, 1914.

An elbow on the main line between Shenandoah and the large reservoir which supplies the town with water burst early this morning and allowed a large part of the water in the reservoir to run away before it could be turned off.

There were nearly four feet of water in the dam but at present there is hardly any. The town did not have any water supply today and will not until the break is repaired.

HAMPERED FOR WATER.

Tamaqua Evening Courier, October 23, 1914.

The Harwood Light Company is hampered for water for its steam heat plant at Shenandoah. As the water is shut off at seven p. m., the company has only sufficient storage to last five hours. The company is compelled to shut down its steam plant after midnight until six o'clock in the morning.

WATER SITUATION DESPERATE.

Philadelphia Press, November 8, 1914.

Ashland, Pa., November 7. The water situation is becoming desperate in this region. At Ashland, Shenandoah and Girardville the supply is scant and its use for domestic purposes is limited to a few hours daily in these towns. At Centralia today the Lehigh Valley collieries were obliged to suspend operations until the situation is relieved. The Reading collieries are being kept in operation by water trains.

DROUGHT SHUTS DOWN COLLIERY.

Philadelphia Press, November 8, 1914.

Shenandoah. Centralia colliery, the largest operation of the Lehigh Valley Coal Company, was shut down yesterday and will remain idle indefinitely because of the drought. Two thousand men and boys are made idle. Unless rain falls soon other operations will be compelled to stop work.

WATER ALMOST WORTH ITS WEIGHT IN GOLD.

Philadelphia Press, November 22, 1914.

Pottsville, Pa., November 22. Agents of coal companies scoured this county all day looking for new sources of water supply in order to prevent the drought, which has now lasted three months, from closing down the collieries, thereby placing 50,000 men in idleness. Pottsville, Frackville, Ashland, Shenandoah, Mahanoy City and Tamaqua have been appealed to for aid by coal companies, but only Pottsville and Frackville have had any water to spare.

The big dam at Kaufmans, built for the use of Pottsville people, has been turned over to the Reading Coal and Iron Company for use, and as it has a large capacity, it will aid

in keeping a number of collieries at work. Most of the other towns appealed to are on a one-hour-a-day supply of water themselves and could not give any aid.

DIAMOND WATER COMPANY CHANGES HOURS OF SERVICE. (Hazleton.)

Newspaper reference not given.

Until further notice the Diamond Water Company will turn on the water from 5 a. m. to 7 a. m.; from 11 a. m. to 1 p. m. and from 5 p. m. to 7 p. m.

DIAMOND WATER COMPANY.

RAIN FOLLOWS PRAYERS TO BREAK DROUGHT

Newspaper reference not given

Pottsville, Pa., November 8. Because thousands of men are threatened with loss of employment through the scarcity of water, rain was prayed for in many churches in this section today. To demonstrate their faith in the efficacy of prayer many persons carried umbrellas to church, although this morning the sun was shining. This evening at six o'clock rain began to fall. It is the first downfall since October 29, and the total precipitation for the last three months is now eleven inches below normal. Railroad officials say it may be necessary to haul water up this valley from the Delaware if the drought is not soon broken.

HAULING WATER BY TRAIN.

Newspaper reference not given.

Mauch Chunk, Pa., November 22. Despite the rain last Sunday there is no end to the drought in this region, and the Lehigh Valley Railroad has put on the road four more water trains, three of which haul water to the operations in the Schuylkill region, while the other will supply water for the collieries near Audenried.

REPORT OF THE GENERAL MANAGER OF THE GIRARD WATER COMPANY.

"The demand for water in the territory supplied by The Girard Water Company has been increasing rapidly during

recent years, due largely to the growing needs of the various collieries, where the coal is coming from greater depths, requiring more steam both for hoisting and pumping, while the development of mining operations has almost entirely destroyed the local sources of supply. Thus, while the precipitation has been fairly constant and for 1913 was slightly above the average, the increase in consumption has made the margin between supply and demand very narrow, and has demonstrated the necessity for an extension of the sources of supply, which The Girard Water Company is now engaged in developing.

"The total consumption for the year 1913 was 508,162,356 gallons, an increase of 63,433,220 gallons, or 14 per cent over 1912, the year of greatest consumption previously. It would have been still greater in 1913 but for the restriction which it was necessary to place on domestic consumption from September 3 to October 20, because of the depleted quantity of stored water, which was at its lowest on September 21 at 36,314,393 gallons. ****************

"The rapid decrease in the quantity of water on hand at the beginning of September made necessary some restriction, and on September 3 the domestic consumers were given water for only two hours daily, which was increased to three hours on September 24, the restriction being removed entirely on October 20. The supply to Bast colliery of the Philadelphia and Reading Coal and Iron Company was entirely cut off from September 16 to September 24, and Girard Mammoth colliery, of the Girard Mammoth Coal Company, was given only a small supply from September 16 to October 25. No water was given to the Shenandoah Citizens Water and Gas Company from August 31 to October 25."

TABLE NO. III

Estimates of Future Population, Consumption, Etc.

	District	Population 1910	Rate of Growth 1890 to 1900	Rate of Growth 1900 to 1910	Estimated population 1950 straight line growth*	Estimated population 1950 geometric progression†	Consumption Million gallons daily 1915	Consumption Million gallons daily 1950*	Consumption Million gallons daily 1950†	Safe yield available under present development Million gal. daily	Deficiency 1950 Million gal. daily	Safe yield (total) possible by further development of watersheds now used. Million gal. daily
1	Hazleton	64,700	22%	21%	116,000	140,000	8.6	15	17.5	8.4	9.1	11.0
2	Mahanoy City	146,900	15%	14%	215,000	256,000	18.1	26	29.5	13.4	16.1	20.5
3	Pottsville	91,900	16%	37%	230,000	320,000	14.4	36	43.3	12.8	30.5	24.0
	Totals	303,500			561,000	716,000	41.1	77	90.3	34 6	55.7	55.5
	Average			22%								

*Assuming an arithmetical progression or straight line increase.

†Assuming a geometrical progression increase.

TABLE NO. IV.

POPULATION

No. 1—Hazleton District

County	Townships	1890	1900	1910
Luzerne	Foster	7,590	4,497	5,545
Carbon	Hazle	12,494	15,143	11,014
Luzerne	Banks	4,461	4,113	4,719
Luzerne	Sugar Loaf	1,854	1,500	1,352
Luzerne	Black Creek	2,178	2,352	1,945
	Total	28,577	27,695	24,575

County	Cities and Boroughs	1890	1900	1910
Luzerne	Freeland Boro.	1,730	5,254	6,197
Luzerne	Jeddo Boro.	358	1,632	377
Luzerne	W. Hazleton Boro.	931	2,516	4,715
Luzerne	Hazleton City	11,872	14,230	25,452
Schuylkill	McAdoo Boro.	----------	2,122	3,389
	Total	14,891	25,754	40,130

Summary:

	1890	1900	1910
Townships	28,577	27,695	24,575
Cities and boroughs	14,891	25,754	40,130
Total	43,468	53,449	64,705

TABLE NO. V

POPULATION

No. 2—Mahanoy City District

County	Township	1890	1900	1910
Schuylkill	North Union	1,124	1,242	1,156
Schuylkill	East Union	1,116	2,553	2,578
Schuylkill	Union	1,310	1,642	1,087
Schuylkill	Kline	3,068	2,692	1,839
Schuylkill	Rush	1,264	1,395	1,343
Schuylkill	Delano	1,362	1,278	1,540
Schuylkill	Mahanoy	6,541	6,214	6,256
Schuylkill	West Mahanoy	4,743	4,864	5,230
Schuylkill	Butler	5,867	3,603	3,900
Northumberland	Coal	8,616	12,473	16,105
Northumberland	Mt. Carmel	8,062	4,321	3,192
	Total	43,073	42,367	44,226

County	Boroughs	1890	1900	1910
Schuylkill	Mahanoy City Boro.	11,286	13,504	15,936
Schuylkill	Gilberton Boro.	3,687	4,373	5,401
Schuylkill	Frackville Boro.	2,520	2,594	3,118
Schuylkill	Shenandoah Boro.	15,994	20,321	25,774
Schuylkill	Girardville Boro.	3,584	3,666	4,396
Schuylkill	Ashland Boro.	6,855	6,438	7,346
Schuylkill	Centralia Boro.	2,761	2,048	2,429
Columbia	Gordon Boro.		1,165	1,185
Schuylkill	Mt. Carmel Boro.	8,524	13,179	17,532
Northumberland	Shamokin Boro.	14,403	18,202	19,588
	Total	69,294	85,490	102,705

Summary:	1890	1900	1910
Townships	43,073	42,367	44,226
Cities and boroughs	69,294	85,490	102,705
Total	112,367	127,857	146,931

TABLE NO. VI

POPULATION

No. 3—Pottsville District

County	Township	1890	1900	1910
Schuylkill	Rahn	2,648	2,938	258
Schuylkill	Schuylkill	530	715	1,960
Schuylkill	Walker	569	542	511
Schuylkill	Blythe	1,320	1,749	2,405
Schuylkill	Ryan	706	719	736
Schuylkill	North Manheim	2,391	2,163	2,035
Schuylkill	Norwegian	819	770	1,167
Schuylkill	East Norwegian	586	586	694
Schuylkill	Newcastle	1,317	1,300	1,554
Schuylkill	Branch	951	1,250	1,559
Schuylkill	Cass	2,642	3,528	4,579
Schuylkill	Foster	494	636	801
	Total	14,973	16,896	18,259

County	Cities and Boroughs	1890	1900	1910
Carbon	Lansford Boro.	4,004	4,888	8,321
Schuylkill	Coaldale Boro.			5,154
Carbon	Summit Hill Boro.	2,816	2,986	4,209
Schuylkill	Tamaqua Boro.	6,054	7,267	9,462
Schuylkill	Middleport Boro.	381	540	1,100
Schuylkill	Port Carbon Boro.	1,976	2,168	2,678
Schuylkill	Mt. Carbon Boro.	333	252	335
Schuylkill	Palo Alto Boro.	1,424	1,707	1,873
Schuylkill	Pottsville City	14,117	15,710	20,236
Schuylkill	St. Clair Boro.	3,680	4,638	6,455
Schuylkill	Minersville Boro.	3,504	4,815	7,240
Schuylkill	Schuylkill Haven Boro.	3,088	3,654	4,747
Schuylkill	Cressona Boro.	1,481	1,738	1,837
	Total	42,858	50,363	73,647

Summary:

	1890	1900	1910
Townships	14,973	16,896	18,259
Cities and boroughs	42,858	50,363	73,647
Total	57,831	67,259	91,906

TABLE NO. VII

Details of Existing Water Systems—Hazleton District

System	Source of Supply	Supply to	Population		Consumption	Estimated safe yield present sources mil. gals. daily	
			Supplied	Total 1915	mil. gals. daily	Existing storage	Fully developed (assumed)
Wyoming Valley W. S. Co. Hazleton Department	Deep Run and Roberts Run	Deep Run and Gowen	190	190	.006	.18	1.67
" " "	Schaars Run and well	Deringer and Fern Glen	425	450	.009	.07	.14
" " "	Trib. of Mud Run, wells and springs	Oneida	1,000	1,000	.20	.20	.24
" " "	Stable Run and Rock Spring	Tombicken	425	500	.006	.01	.01
" " "	Spring	Stockton	100	100	.003		
" " "	Sand Spring, Hunters Run, Porter Swamp and wells	Drifton, Buck Mtn. & Eckley	2,518	2,518	.55	.38	.38
" " "	Catawissa Creek, Boyds Run, Quakake Creek, and Dreck Creek	Hazleton, West Hazleton, Jeanesville and Yorktown	25,000	34,400	3.50	2.60	5.00
Diamond Water Co.	Wolfs Run, Barnes Run and wells	Hazleton and West Hazleton, Cranberry	20,000		1.00	1.00	1.14
Rock Glen—Private	Falls Run	Rock Glen	300	300		.12	.24
Cranberry—Private (A. Pardee & Co.)	Grape Run and wells	Cranberry and collieries	130	600	.35	.35	.35
Conyngham Water Co.	Tunnel springs	Conyngham	400	400	.012	.02	
Beaver Brook Water Co. (C. M. Dodson & Co.)	Wells	Beaver Brook & collieries	750	750	.255	.26	.26
Hazle Township W. Co. (Harwood Electric Co.)	Catawissa Creek & wells	Harwood	750	750	.03	.03	.03
Honeybrook Water Co. (Lehigh & Wilkes Barre Coal Co.)	Catawissa Creek	McAdoo, Audenried Honeybrook, Tresckow & Banks Twp.	6,300	6,300	1.25		

Details of Existing Water Systems—Hazleton District

System	Source of Supply	Supply to	Population		Consumption	Estimated safe yield present sources mil. gals. daily	
			Supplied	Total 1915	mil. gals. daily	Existing storage	Fully developed (assumed)
Citizens Water Company of Beaver Meadow	Springs	Beaver Meadow	1,400	1,530	.056	.05	.05
Pardee Bros. & Co. Inc.	Wells	Lattimer and collieries	3,000	3,000	.73	.73	.73
Weatherly Water Co.	Penrose Run	Weatherly	2,100	2,480	.07	.15	.15
Freeland Water Co.	Wells	Freeland and S. Heberton	6,650	6,650	.50	.50	.50
G. B. Markle Company	Wells and Diamond Water Company	Jeddo, Ebervale, Highland, Oakwood, Harleigh and collieries	3,500		1.00 (Estimate)		
J. S. Wentz & Co. (Midvalley Coal Co.)	Wells	Hazlebrook colliery			.48		
Wolf Coal Co.	Wells	Collieries at Lattimer			.04		
Harleigh-Brookwood Coal Co.	Wells	Collieries at Harleigh			.01		
F. A. Briesch (Private)	Wells	Nuremburg	100	750	.001		
Hazle Mtn. Coal Co.	Wells	Collieries at Conyngham			.02		
L. V. R. R. Conyngham Sta.	Springs				.03		
L. V. R. R. Vexit Jct.	Creek				.012		
L. V. R. R. Weatherly	Small reservoir				.068		
L. V. R. R. Black Cr. Jct.	Small reservoir				.025		

Details of Existing Water Systems—Mahanoy—Shamokin District

System	Source of Supply	Supply to	Population		Consumption	Estimated safe yield present sources mil. gals. daily	
			Supplied	Total 1915	mil. gals. daily	Existing storage	Fully developed (assumed)
Roaring Creek Water Co.	Eagle Run, Trout Run, South Branch Roaring Creek.	Shamokin and Coal Twp.	35,000	38,885	5.00	*3.24	4.6
Bear Gap Water Co.	South Branch Roaring Creek.	Mt. Carmel, Kulpmont, Marion Heights and collieries in Mt. Carmel Twp.	24,600	25,600	1.49	1.80	2.80
Wyoming Valley W. S. Co. Locust Mountain Dept.	South Branch Roaring Creek.	Centralia, Aristes, Byrnesville and Wilburton and collieries.	4,200	4,200	0.064	0.64	2.4
Wyoming Valley W. S. Co. Delano Dept.	Tribs. N. Br. Mahanoy Creek.	Delano, Delano Junction, Park Place, Buck Mtn. and collieries.	3,000	3,000	.70	.70	.70
Mt. Carmel Water Co.	Springs and wells and Bear Gap Water Co.	Mt. Carmel	(a)	(a)	(a)	(a)	(a)
Ashland Water Works	Springs	Ashland	7,000	7,000	.50	.50	.50
Miners State Hospital System, Fountain Sprgs.	Bright Run and Springs	Hospital	300	300	.08	.08	.08
Citizens Water Company of Gordon	Big Spring	Gordon	900	1,200	.09	.09	.09
Girard Water Co. (Girard Estate)	Dreshers Run and Whisky Mill Creek.	Roaring Creek, Conyngham, Butler, Mahanoy, W. Mahanoy, Union and E. Union Twps. and many collieries.	12,000	12,000	1.40	1.00	1.77

(*) Does not include 4.4 square miles on headwaters belonging to Wyoming Valley W. S. Co. which also furnishes some yield to Shamokin.

(a) Included principally under Bear Gap Water Company above.

System	Source of Supply	Supply to	Population		Consumption	Estimated safe yield present sources mil. gals. daily	
			Supplied	Total 1915	mil. gals. daily	Existing storage	Fully developed (assumed)
Mountain City Water Co.	Wells	Frackville	1,700	3,500	.04	.04	.04
Anthracite Water Co. P. R. C. I. Co.	Mud and Waste House Runs	Gilberton, Yatesville, St. Nichola and many collieries	5,400	5,400	1.05	1.10	1.10
Shenandoah Water Works	Davis, Spiese and Ulshafer runs,	Shenandoah	20,000	28,649	2.00	.52	1.25
Shenandoah Citizens Water Co.	Kehley, Fowler and Bairds runs and Cold Spring	Shenandoah and collieries	5,000		1.25	0.40	0.48
Mahanoy City Water Co.	Messers, Coal and Pole runs.	Mahanoy City and collieries	19,000	19,000	2.00	1.58	3.05
M. R. MeTurk Coal Co.	Well and mtn. stream.	Colliery at Girardville.			0.024		
Harleigh-Brookwood Coal Co.	Wells	Collieries at Mahanoy Plane			.195		
Girard Mammoth Coal Co.	Raven Run	Collieries at Raven Run			.100		
Thomas Colliery Co.	Kehley Run	Collieries at Shenandoah			.150		
Lehigh Valley Coal Co.	Wells	Collieries at Buck Mountain			.015		
Phila. & Reading Ry.—					.218		
Brandonville Station	Stream				.175		
E. Mahanoy Junction	Hosensock Creek				.076		
Lofty	Stream				.009		
Mahanoy Tunnel	Spring				.320		
Gordon	Rattling Run						
Pennsylvania Railroad—					.021		
Rock Glen Junction	Falls Run				.012		
New Boston	Run				.016		
Darkwater	Run						
Central R. R. of New Jersey—					.050		
Haucks	Well				.010		
Tamanend	Creek				.025		
Silver Brook	Creek						
Lehigh Valley Railroad—					.004		
Morea	Stream				.020		
Stewarts	Stream				.033		
Yatesville	Stream						

Details of Existing Water Systems—Mahanoy—Shamokin District

System	Source of Supply	Supply to	Population		Consumption	Estimated safe yield present sources mil. gals. daily	
			Supplied	Total 1915	mil. gals. daily	Existing storage	Fully developed (assumed)
Wyoming Valley W. S. Co. Blackwood Dept.	Black and Panther Creeks	Blackwood	600	600	.14	.15	1.57
Crystal Water Co. P. & R. C. & I. Co.	W. W. Branch, Schuylkill River	Lytle, Forestville, Branchdale and Llywellyn and collieries.	5,000	5,000	2.16	.45	3.15
P. & R. C. & I. Co.	W. Br. Schuylkill River	Glen Carbon	60			.02	.09
P. & R. C. & I. Co.	Trib. of W. Br. Schuylkill River and Crystal W. Co.	Thomaston Col.				.02	.09
Minersville Water Co.	Dyers, Wagner and Wheelers runs.	Minersville	10,000	10,000	1.00	.75	3.05
Butcher Spring W. Co.	Butcher Creek	Newcastle	300	500	.012	.01	.02
Darkwater Coal Co.	Kelley Hollow Creek also Pottsville Water Co.	Darkwater colliery at Minersville.			.10	.05	.05
Pottsville Water Co.	Kauffmans, Eisenhuths, Tar and Indian runs and Wolf Creek.	Pottsville, St. Clair, Port Carbon, Palo Alto, Mt. Carbon and collieries	35,000	35,000	5.00	3.42	4.90
Sheafers Creek W. Co.	Sheafer Creek & Spring	Silverton	83	83	.002	.05	.23
Morea Water Co.	Wells	Morea and collieries	980	980	.34	.34	.34
Dodson Coal Co.							
Schuylkill Haven G & W C.	Hummels, Berkelbach runs and Panther Creek.	Schuylkill Haven & Cressona	6,500	6,800	.30	.15	.28
P. & R. C. & I. Co.	Mohannon Creek	Schuylkill Haven Coal Storage Yard			.40	.30	.60
Orwigsburg Water Works	Silfis Run	Orwigsburg	1,900	1,950	.05	.18	.20
Silver Creek Water Co.	Silver and Big Creeks and Tumbling Run	New Philadelphia and Cumbola and collieries and P&R Ry. at St. Clair.	3,200	4,500	1.30	3.06	5.21

System	Source of Supply	Supply to	Population		Consumption	Estimated safe yield present sources mil. gals. daily	
			Supplied	Total 1915	mil. gals. daily	Existing storage	Fully developed (assumed)
Tamaqua Water Works	Owl Creek and Rabbit Run and 3 wells	Tamaqua and P. & R. Ry.	11,500	12,000	1.40	1.40	1.40
Oak Hill Coal Co.	Well and Minersville W. Company	Colliery at Minersville			.012		
Pine Hill Coal Co.	Not stated	Collieries at Minersville			.133		
Mill Creek Coal Co.	Small stream	Collieries at New Boston	800		.106		
Port Carbon Coal Co.	Small stream	Collieries at Port Carbon			.054		
East Lehigh Colliery Co.	L. Schuylkill River, also Tamaqua Water Works	Collieries at Tamaqua			.037		
Gorman & Campion	Schuylkill River	Collieries at Tuscarora			.110		
Maryd Coal Co.	Swifts & Tarmans Creeks	Collieries at Tuscarora	450		.085		
Mt. Hope Coal Co.	L. Mill Creek, also Pottsville Water Co.	Collieries at St. Clair					
Eastern Steel Co.	West Norwegian Creek	Steel mills			1.300		
Pennsylvania Railroad—							
Mt. Carbon	Spring				.120		
Phila. & Reading Ry—							
Cressona	Brook				.100		
Fern Siding	Spring				.040		
Middleport	Brook				.075		
Mine Hill Crossing	Schuylkill River				.040		
New Ringold	Brook				.150		
Silverton	Stream				.025		
Lehigh Valley Railroad—							
Glenworth	Stream				.030		

TABLE NO. VIII

Largest Water Supply Systems

System	Controlled by	Average daily Consumption (mil. gals.)	District No.
Wyoming Valley Water Supply Co.	Lehigh Valley Coal Co.	4.38	1
		.76	2
		.14	3
Diamond Water Co.		1.00	1
Honeybrook Water Co.	Lehigh & Wilkes-Barre Coal Company	1.25	1
Shenandoah Municipal Works		2.00	2
Shenandoah Citizens Water Co.		1.25	2
Mahanoy City Water Co.		2.00	2
Roaring Creek and Bear Gap Water Cos.		6.50	2
Girard Water Co.	Girard Estate	1.40	2
Anthracite Water Co.	P. & R. Coal & Iron Co.	1.05	2
Private (Schuylkill Haven coal storage yard)	P. & R. Coal & Iron Co.	.40	2
Crystal Water Co.	P. & R. Coal & Iron Co.	2.16	3
Silver Creek Water Co.	P. & R. Coal & Iron Co.	1.30	3
Private mine systems	P. & R. Coal & Iron Co.	4.35	1, 2 & 3
Pottsville Water Co.	Supplies many collieries, including P. & R. C. & I. Co.	5.00	3
Minersville Water Co.		1.00	3
Tamaqua municipal works		1.40	3
Other smaller systems		4.75	
Total		41.99	

TABLE NO. IX

Prevailing Wholesale Water Rates

Company	Meter Rates: Cents per 1,000 gals.	Meter Rates: Monthly Minimum (gals.)	Places supplied	System of supply
Hazelton District				
Wyoming Valley Water S. Co.	10	666,667	Hazleton, Drifton, Tomhicken, &c.	Pump
Diamond Water Co.	10	666,667	Hazleton, West Hazleton, &c.	Pump
Freeland Water Co.	12.5	100,000	Freeland, etc.	Pump from wells
Honey Brook Water Co.	6	*125,000		
Mahanoy City—Shamokin Dist.				
Wyoming Valley Water S. Co.	10	500,000	Delano, &c.	Gravity
Mahanoy City Water Co.	10	1,000,000	Mahanoy City	Pump (842' H)
Anthracite Water Co.	5	33,300,000	Gilberton, &c.	Gravity
	3	50,000,000		
Shenandoah Citizens Water Co.	10		Shenandoah	Gravity and buy.
Shenandoah Municipal			Shenandoah	Pump (842' H)
Girard Water Co.	10		Shenandoah to Girardville	Pump (755' H)
Mountain City Water Co.	10	**400,000	Frackville	Pump from well
Ashland	19	500,000	Ashland	Gravity
Wyoming Valley Water S. Co.	15	233,000	Centralia, &c.	Pump (658' H)
Mt. Carmel Water Co.	15		Mt. Carmel	Gravity and buy.
Bear Gap Water Co.	10	250,000	Mt. Carmel Township	Pump (765' H)
Roaring Creek Water Co.	5⅓	†1,870,000	Shamokin, &c.	Gravity
Pottsville District				
Panther Valley Water Co.	6	‡1,000,000	Lansford, Coaldale, &c.	Gravity
Summit Hill Water Co.	31¼	& contracts	Summit Hill	Pump from well
Tamaqua Municipal	5	6,000,000	Tamaqua	Pump
Silver Creek Water Co.	5	33,300,000	New Philadelphia, &c.	Gravity
	3	50,000,000		
Pottsville Water Co.	8	‖82,000	Pottsville, &c.	Gravity and pump
Minersville Water Co.	8	1,310,000	Minersville	Gravity
Crystal Water Co.	5	33,300,000	Lytle, &c.	Gravity
	3	50,000,000		
Schuylkill Haven Gas & W. Co.	9	§60,400	Schuylkill Haven, &c.	Gravity
Wyoming Valley Water S. Co.	15	233,000	Blackwood	Pump

*Sliding scale below 125,000 gallons averages 10c.
**More than 800,000 by contract.
†Collieries $1.33⅓ per H. P. per year.
‡Sliding scale below 1,000,000 gallons averages 11c.
‖Sliding scale below 82,000 gallons averages 13c.
§Sliding scale below 60,400 gallons averages 16c.

TABLE NO. X

Sources Considered.

Stream	Site	Location	Watershed area sq. mi.	Dam Height feet	Dam Length feet	Water Surface Area sq. mi.	Water Surface Percent	Reservoir Capacity Total Mil. gals.	Reservoir Capacity Per sq. mi.	Reservoir Elevations Low Water	Reservoir Elevations High Water	Remarks
Nescopeck Creek	A	Butler Twp. Luzerne County at Drums village.	50.0	66	1550	2.66	5.3	11,000	220	*1040	1091	Selected as most favorable—at least for Districts 1 & 2.
Nescopeck Creek	B	Butler Twp. Luzerne County about 2 miles below "A"	57.6	100	1650	1.62	2.8	7,500	132	980	1060	
				95				5,600	97		1055	
Catawissa Creek	C	East Union Twp. Schuylkill County near Brandonville 4 miles north of Shenandoah.	35.9	110	1000	0.80		5,800	161	950	1040	Smaller watershed area, lower elevation hence greater lift, less storage, &c., as compared with "A"
				95				3,600	100		1025	
Catawissa Creek	D	Beaver Twp. Columbia County 9 miles downstream from "C"	110.2	105	450	1.14		7,500	67	715	800	Data worked up as possible power site.
Little Schuylkill River	EF		40.2			1.05	2.6	5,200	130			Selected as most favorable probably for District 3.
(a) Reservoir E, Little Schuylkill		Rush Twp. Schuylkill County north of Mintzers Station near railroad crossing.	18.6	100	1100	0.55		3,500	188	1030	1110	
(b) Reservoir F, Locust Creek.		Ryan Twp. Schuylkill County 3¼ miles upstream from jct. with Little Schuylkill.	9.1	70	1240	0.50		1,700	187	1120	1170	
(c) Intake EF, Little Schuylkill.		Rush Twp. Schuylkill Co. 2 miles north of Tamaqua.	12.5							930 Intake		
Deep Creek, tributary Pine Creek, tributary Mahantango.	G	Hegins Twp. Schuylkill Co. 1 mile north of Hegins.	20.6	75				4,500	220	735	790	Undesirable on account of low elevation requiring too great lift in pumping.
				65		0.50	2.5	2,960	144		780	

*Assumed lowest draft=5 feet above bottom for Site A, and for all other sites is 10 feet above bottom.

Sources Considered.

Stream	Site	Location	Watershed area sq. mi.	Dam		Water Surface		Reservoir				Remarks
								Capacity		Elevations		
				Height feet	Length feet	Area sq. mi.	Percent	Total Mil. gals.	Per sq. mi.	Low Water	High Water	
Little Swatara Creek trib. Swatara Creek.	H	Washington Twp. Schuylkill Co. 3 mis. north Pine Grove	15.8	50	-------	-------	-----	3,500	220	560	590	Undesirable on account of low elevation requiring too great lift in pumping.
Swatara Creek ----------	K	Washington Twp. Schuylkill Co. ½ mi. northeast of Rock	17.8	49	-------	-------	-----	3,900	220	615	644	Undesirable on account of low elevation requiring too great lift in pumping.
Schuylkill River (filtration and pumping)		Near Pottsville.										
Lehigh River ----------		Near Stoddartsville ----------	226.0	-------	-------	-------	-----	-------	-------	-------	-------	No topographic sheets. Believed to be good dam site in this vicinity. Gravity supply might be obtained more cheaply than from any other source investigated.

TABLE NO. XI

ESTIMATED COST OF WATER BY VARIOUS SCHEMES

Includes interest, depreciation, operation and miscellaneous. Excludes sinking fund.

Scheme	Source	First Cost	Uniform cost after full development	Remarks
		(Cents per 1000 gallons)		
1-*	A	6.6	6.1	Limit of supply reached in 27 years.
1-**	A	8.5	5.8	District 3 begins drawing on "A" at end of 30 years.
	EF	5.8	3.3	
	Weighted average	7.3	4.9	Limit of supply reached in 39 years.
2-*	*A	6.2	5.8	Development at "EF" postponed for 27 years.
	EF		3.0	
	Weighted average	6.2	4.4	Limit of supply reached in 39 years.
2-**	*A	8.3	5.3	District 3 begins drawing on "A" at end of 30 years.
	EF	5.8	3.1	
	Weighted average	7.2	4.5	Limit of supply reached in 39 years.

(*) Includes cost (distributed) of booster service as follows:

2-*	A	.56	.88
2-**	A	.84	.88

KEY:

1-* Nescopeck Creek—"A"—High Lift Route, supply to all three districts.

1-** Nescopeck Creek—"A"—High Lift Route, and Little Schuylkill River—"EF", each source developed simultaneously. During first 30 years "EF" supplying District 3 and A supplying Districts 1 and 2. Thereafter District 3 to draw from "A" also.

2-* Nescopeck Creek—"A"—Low Lift Route, supplying all three districts to limit of yield, supplemented when required by "EF".

2-** Same as 1-**, except "Low Lift" route from "A".

TABLE NO. XII

Neshopeck Creek (A) and Little Schuylkill River (EF)—"High Lift Route" assumed Schedule of Development, Schemes 1-a and 1-b

Date‡	Supply Requirements Million Gallons Daily				Reservoirs			Pumps			Pipe Lines						
					Storage		Distributing	Capacity (mgd.)			Required Capacity (mgd.)						
	District							Each installation			From A			From EF			
	1 & 2 From A only	3 From A	3 From EF	Total	Site	Total safe yield developed for. (mgd.)	Total capacity (mg.)	A	EF	Total	Each installation C.I. or Steel	Each installation wood stave	As a whole total	Each installation C. I.	Each installation wood stave	As a whole total	As a whole grand total
								SCHEME 1-a									
1915					A	15.0	140	15 & 10		25	S-15 ††CI-7	13	15				15
1923	9.0	6.0		15.0	A	40.0	280	25 & 15		65	S-25 ††CI-15	20.5	40				40
1942	19.5	20.5		40.0									40				40
								SCHEME 1-b									
1915					A EF	12.5 15.0	140	5 & 5	5 & 5	20	15	*9	12.5	10.5	10.5	10.5	23.0
1922	8.0		6.0	14.0				12.0	10.0	48							
1930	12.5		10.5	23.0	A EF	40.0 24.0						†12	15.0	13.5	13.5	24.0	39.0
1935	15.0		15.0	30.0				20.0	12.0	80	25		30.0				54.0
1945	22.0		24.0	46.0			280	**20.0	**12.0	86	CI-12	§18	40.0		**10.5	24.0	64.0
1950	25.0	6.5	24.0	55.5				**20.0	**12.0	96							
1954	28.0	12.0	24.0	64.0													

(††) Cast iron line leading from Shenandoah to District 3, supplies also Frackville of District 2

(*) Corresponds to capacity of 12.5 mgd. at pumps to which capacity entire line, except steel force main is proportioned.

(†) Corresponds to capacity of 17.5 mgd. at pumps. Entire line with exception of steel force main (which now limits capacity of line as a whole) now has capacity corresponding to 30 mgd. at pumps.

(**) Replacement of 1915 and 1922 installations.

(‡) Cast iron main of 12 mgd. capacity laid to carry water into District 3.

(§) Replacement of 1915 installation. Entire system now proportioned for capacity of 40 mgd. at pumps.

(‡) On supposition that works were constructed ready for operation in 1915.

SUPPLEMENTARY NOTES

1-a Nescopeck Creek—"A"—High Lift Route, supply to all three districts.
1-b Nescopeck Creek—"A"—High Lift Route, and Little Schuylkill River—"EF"—each source developed simultaneously. During first 30 years "EF" supplying District 3 and "A" supplying Districts 1 and 2. Thereafter District 3 to draw from "A" also.

SCHEME 1-a.

1915 STORAGE RESERVOIR: "A"—Build dam high enough to furnish safe yield of 15 mgd.
DISTRIBUTING RESERVOIR: Build as a twin, to hold 7 day's supply from source "A". Capacity for 1915 installation 140 mg.
PUMPS: Install 2 units at "A", one in reserve. Replace in 1945. Capacity with largest unit out of service, 10 mgd.
PIPE LINES: "A"—One line proportioned for capacity of 15 mgd. at pumps. Wood stave portion requires replacement in 1945.
SUPPLY: Sufficient for demand until 1923.

1923 STORAGE RESERVOIR: "A"—Complete dam up to full height, safe yield 40 mgd.
DISTRIBUTING RESERVOIR: Complete installation by adding 140 mg. basin, making total of 280 mg.
PUMPS: Install 2 additional units at "A". Replace in 1953. Capacity with largest unit out of service, 40 mgd.
PIPE LINES: "A"—Install second line proportioned for capacity of 25 mgd. at pumps. Wood stave portion requires replacement in 1953. Total capacity of system now 40 mgd. at pumps, fully installed.
SUPPLY: Sufficient for demands until 1942.
1942 SUPPLY: Demand after 1942 becomes greater than supply, and other watersheds must he developed.

SCHEME 1-b

1915 STORAGE RESERVOIR: "A"—Build dam high enough to furnish safe yield of 12.5 mgd. "EF"—Build dam at "E" to full height; yield together with intake 15 mgd.
DISTRIBUTING RESERVOIR: Same as Scheme 1-a.
PUMPS: Install 2 units at "A" and 2 at "EF," one being in reserve at each place. Replace in 1945. Capacity, with largest unit out of service at each station, is 8 mgd. at "A," and 5 mgd. at "EF."
PIPE LINES: "A"—Line as a whole proportioned for delivery of 12.5 mgd. at pumps, make steel force main of 15 mgd. capacity. "EF"—One 10.5 mgd. line for District 3 only. Wood stave portion of above lines requires replacement in 1945.
SUPPLY: Sufficient for demands until 1930.

1922 PUMPS: Install one unit at "A" and one at "EF." Capacity, with largest unit out of service at each station, is 16 mgd. at "A" and 10 mgd. at "EF." Replace in 1950.

1930 STORAGE RESERVOIR: "A"—Complete dam up to full height. Safe yield 40 mgd. "EF"—Build dam at "F" to its full height. This together with dam at "E" and intake, will safely yield 24 mgd. Reservoirs are now completely developed.
PIPE LINES: "A"—Build wood stave portion only of line which is proportioned for capacity of 17.5 mgd. at pumps. Entire line, with exception of steel force main, now proportioned for capacity of 30 mgd. at pumps. "EF"—Build entire line of 13.5 mgd. capacity. Wood stave portion of above lines requires replacement in 1960.
SUPPLY: Sufficient for demands until 1935.

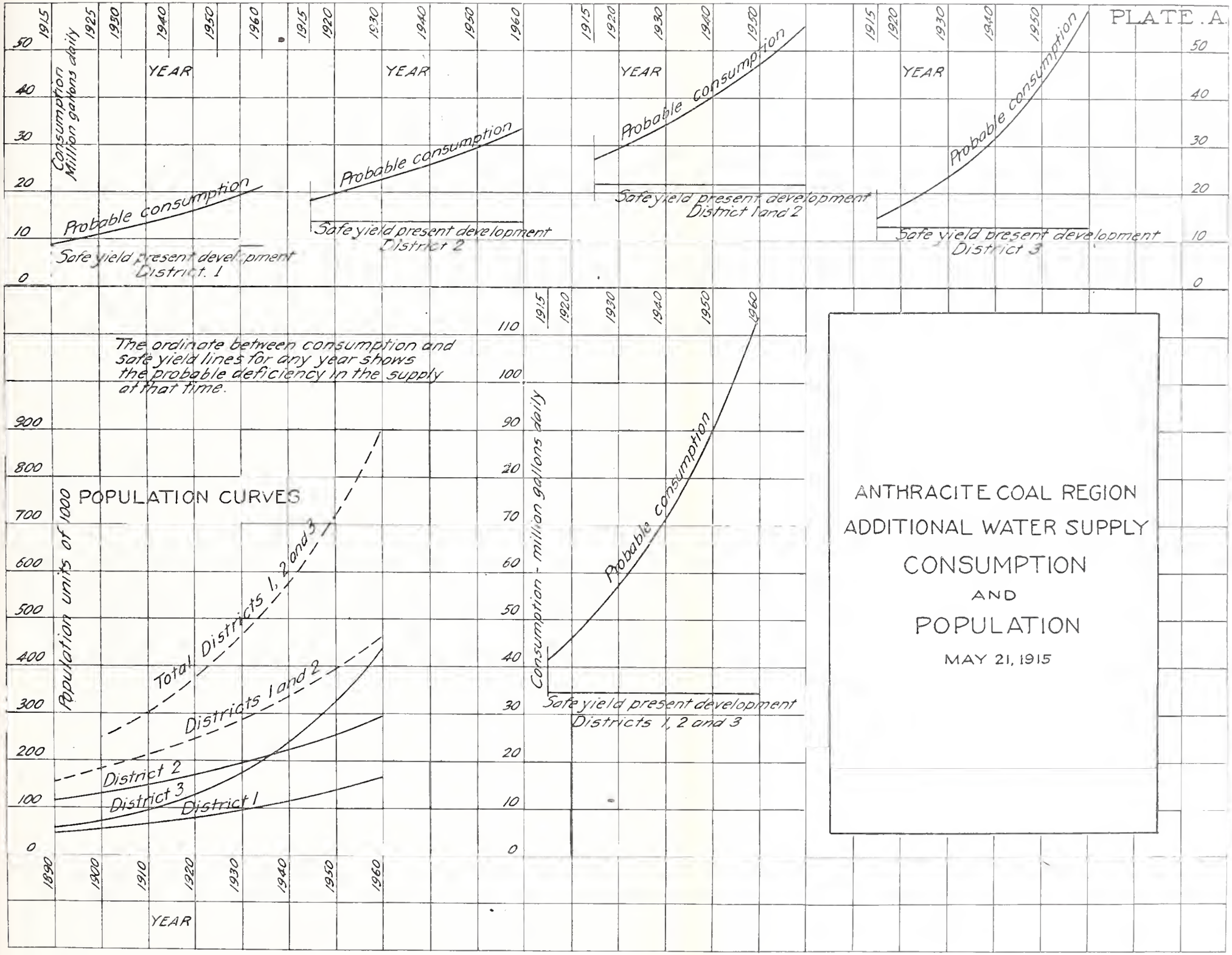
1935 PUMPS: Install one unit at "A" and one at "EF." Capacity, with largest unit out of service at each station, is 28 mgd. at "A" and 20 mgd. at "EF."
PIPE LINES: "A"—Install additional steel force main of 25 mgd. capacity. Capacity of line at pumps now 40 mgd. The wood stave portion limits capacity of line as a whole, it corresponding to 30 mgd. at pumps.
SUPPLY: Needs of District 3 determine next installation, which must be in 1945.

1945 DISTRIBUTING RESERVOIR: Complete installation by adding 140 mg. basin, making total of 280 mg.
PUMPS: Replace 1915 installations at "A" and "EF" with larger units. Capacity, with largest unit out of service at each station, now is 32 mgd. at "A" and 22 mgd. at "EF".
PIPE LINES: The total safe yield at "EF," 24 mgd., is required for District 3 by 1945, and any excess over it must be supplied hy "A". "A"—Replace the 9 mgd. wood stave line of 1915 with a line of 18 mgd. capacity. Beyond Hazleton both lines have total capacity 30 mgd. (at pumps 40 mgd.), the requirements of Districts 2 and 3. Also initial 12 mgd. cast iron line leading from Shenandoah over to Pottsville; this carries to District 3, the required excess over the safe yield of "EF." "EF"—Replace wood stave portion of 10.5 mgd. 1915 installation with one of equal capacity.
SUPPLY: Sufficient for demands until 1954.

1950 PUMPS: Replace the 1922 installation at "A" and "EF" with larger units, capacity, with largest unit out of service at each station, now is 40 mgd. at "A" and 24 at "EF."

1954 SUPPLY: Just sufficient for demands; new sources must be developed.

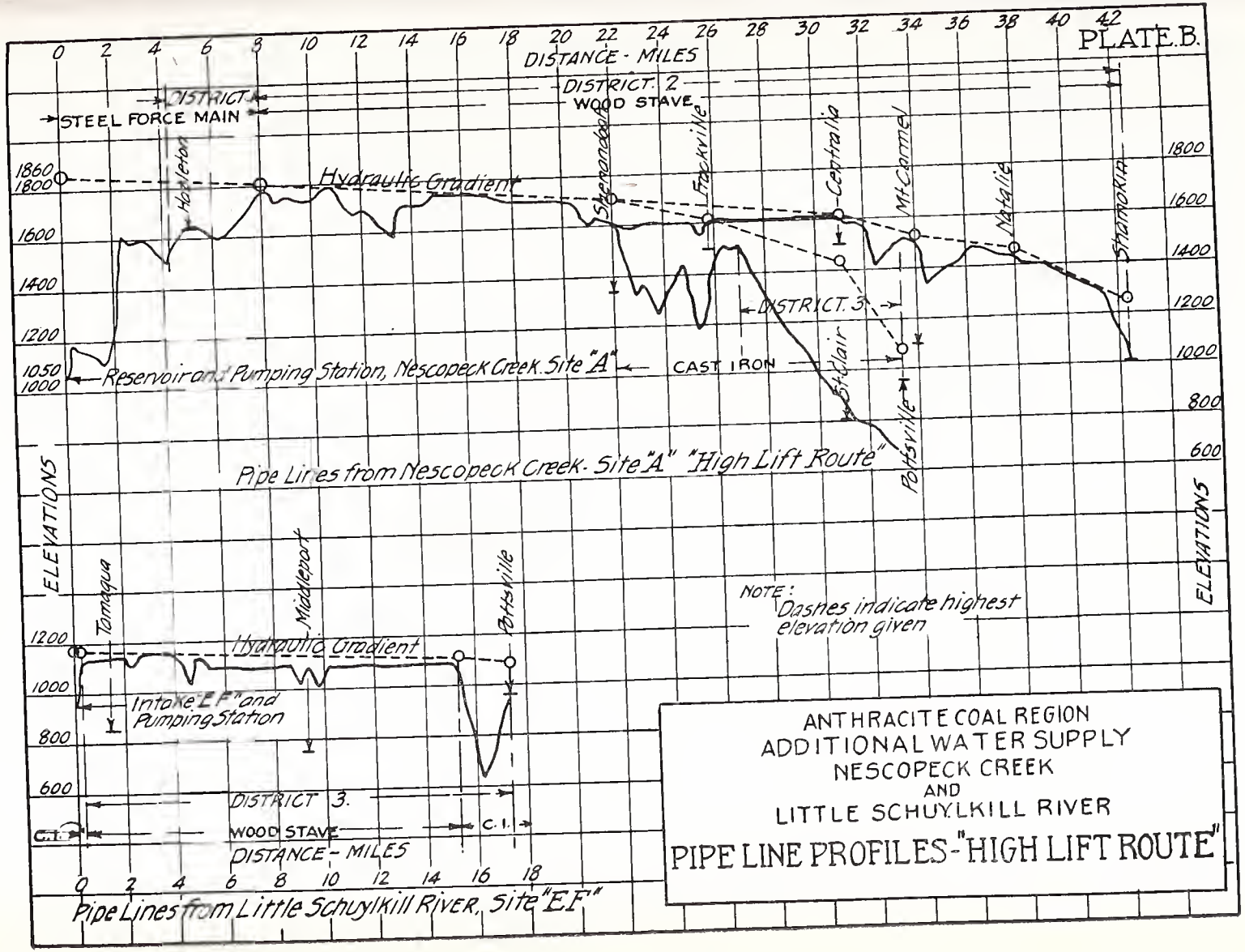
PLATE. A.


Consumption Million gallons daily
YEAR
Probable consumption
Safe yield present development District 1
Probable consumption
Safe yield present development District 2
Probable consumption
Safe yield present development Districts 1 and 2
Probable consumption
Safe yield present development District 3
The ordinate between consumption and safe yield lines for any year shows the probable deficiency in the supply at that time.
POPULATION CURVES
Population units of 1000
Total Districts 1, 2 and 3
Districts 1 and 2
District 2
District 3
District 1
YEAR
Consumption - million gallons daily
Probable consumption
Safe yield present development Districts 1, 2 and 3

ANTHRACITE COAL REGION
ADDITIONAL WATER SUPPLY
CONSUMPTION
AND
POPULATION

MAY 21, 1915

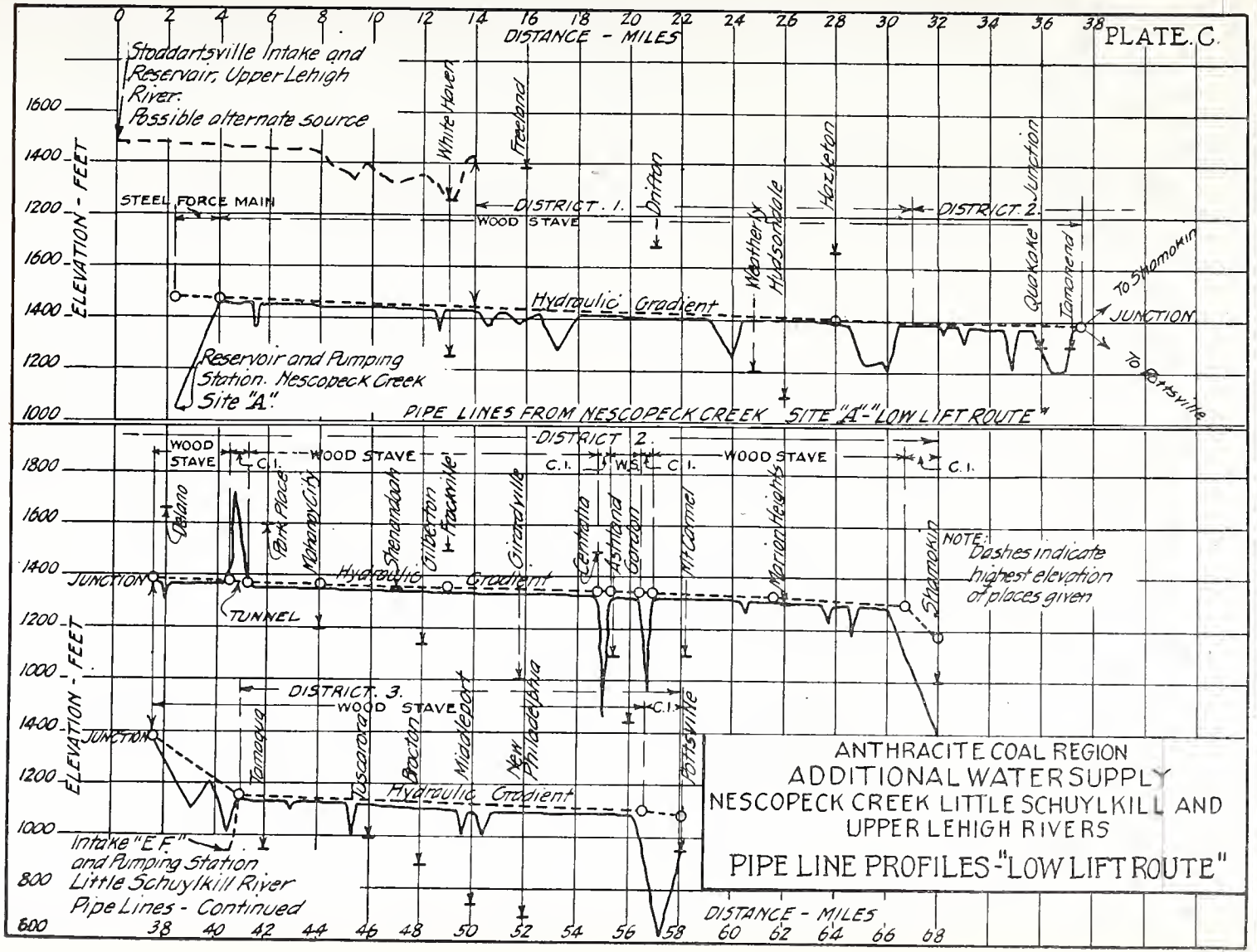
PLATE B.



ANTHRACITE COAL REGION
ADDITIONAL WATER SUPPLY
NESCOPECK CREEK
AND
LITTLE SCHUYLKILL RIVER

PIPE LINE PROFILES - "HIGH LIFT ROUTE"

PLATE. C.



ANTHRACITE COAL REGION

ADDITIONAL WATER SUPPLY

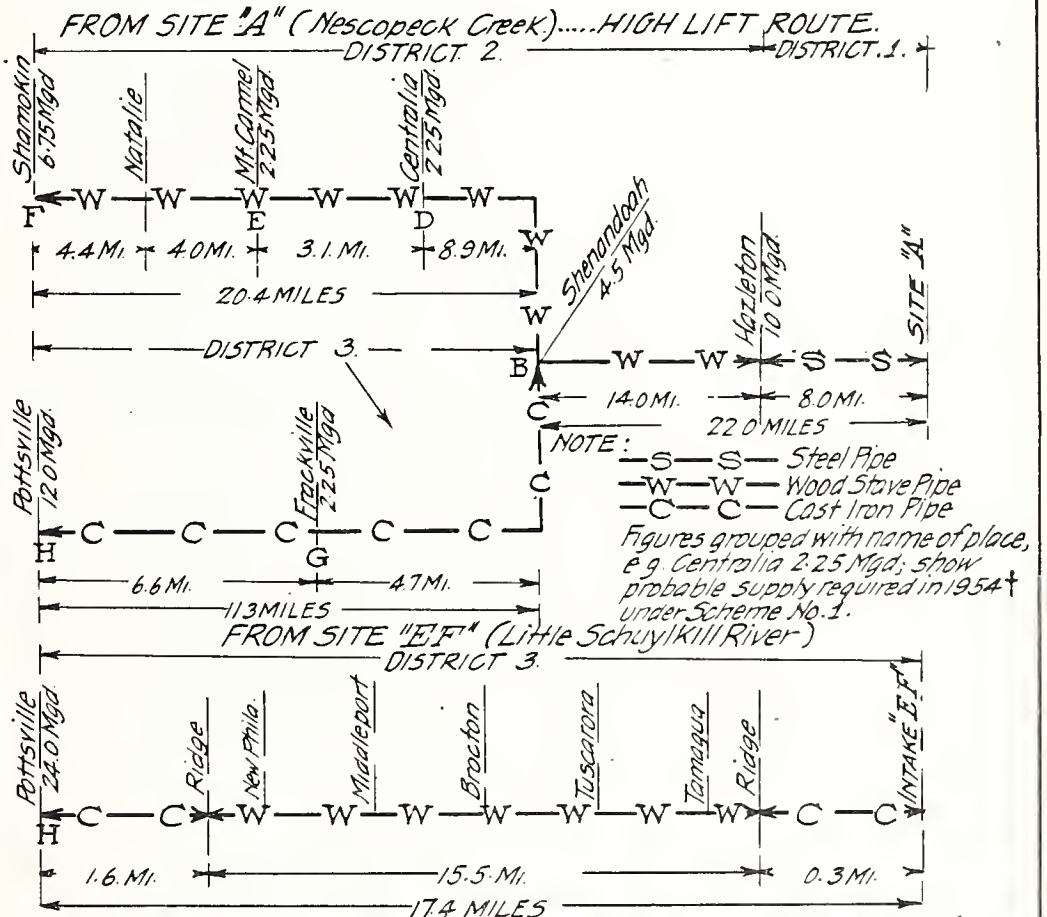
NESCOPECK CREEK LITTLE SCHUYLKILL AND UPPER LEHIGH RIVERS

PIPE LINE PROFILES - "LOW LIFT ROUTE"

PLATED.

ANTHRACITE COAL REGION-ADDITIONAL WATER SUPPLY PIPE LINES AND SUPPLY REQUIREMENTS

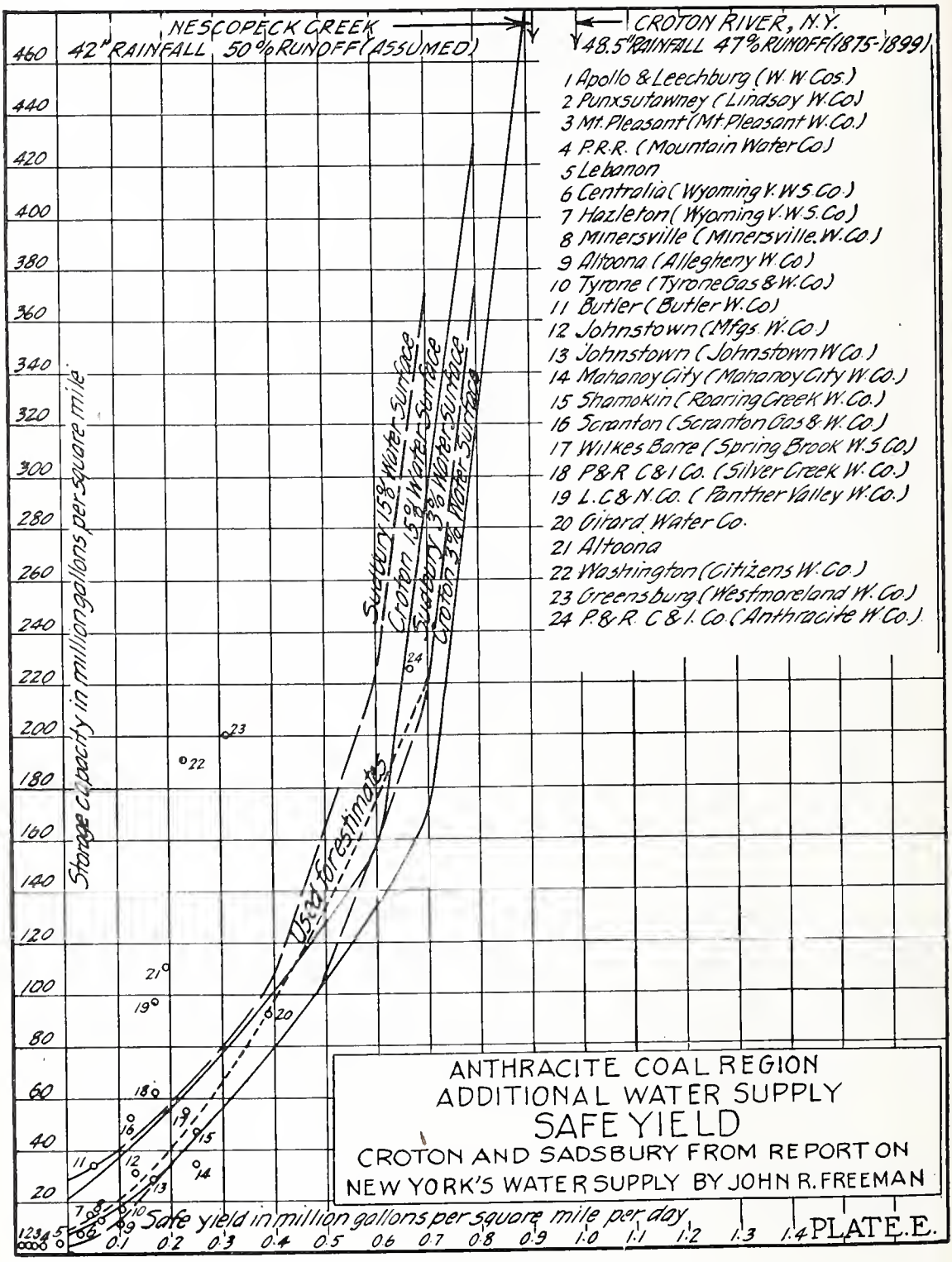
SCHEMES 1-a AND 1-b



SUPPLY REQUIREMENTS AT CENTERS INDICATED ABOVE. Mgd.

SCHEME NUMBER	YEAR	DISTRICT 1.		DISTRICT 2.						DISTRICT 3.			THREE DISTRICTS
	Note †									FROM SITE			COMBINED
		A	TOTAL	B	D	E	F	G*	TOTAL	A	E.F.	TOTAL	TOTAL
1-a	1923	2.0	2.0	1.7	0.9	0.9	2.6	0.9	7.0	6.0		6.0	15.0
	1942	6.5	6.5	3.3	1.6	1.6	4.9	1.6	13.0	20.5		20.5	40.0
1-b	1923	1.5	1.5	1.6	0.8	0.8	2.5	0.8	6.5		6.0	6.0	17.0
	1930	3.5	3.5	2.2	1.1	1.1	3.5	1.1	9.0		10.5	10.5	23.0
	1935	5.0	5.0	2.5	1.25	1.25	3.75	1.25	10.0		15.0	15.0	30.0
	1945	7.5	7.5	3.6	1.8	1.8	5.5	1.8	14.5		24.0	24.0	46.0
	1950	9.0	9.0	4.0	2.0	2.0	6.0	2.0	16.0	6.5	24.0	30.5	55.5
	1954	10.0	10.0	4.5	2.25	2.25	6.75	2.25	18.0	12.0	24.0	36.0	64.0

Scheme 1-a assumes supply from source "A" to all three districts.
Scheme 1-b assumes supply from source "E.F." to district 3 only and from source "A" to districts 1 and 2 (also to district 3 after 1945
(*) Frackville supply under Scheme 1-b taken from trunk main between Shenandoah and Shamokin
(†) Dates given are on the assumption that works were constructed ready for operation in 1915



ANTHRACITE COAL REGION
ADDITIONAL WATER SUPPLY
SAFE YIELD
CROTON AND SADSBURY FROM REPORT ON
NEW YORK'S WATER SUPPLY BY JOHN R. FREEMAN

PLATE E.

CHAPTER III

A PROGRAM OF THE HYDROGRAPHIC SERVICE OF THE WATER SUPPLY COMMISSION OF PENNSYLVANIA.

INTRODUCTION

The creation of the Water Supply Commission of Pennsylvania was in recognition of the fact that the water supply of the state requires control and regulation; that it is subject to misuse and abuse if uncontrolled, and that the state is the only proper authority to have and to exercise this final control. The legislation of recent years recognizes that floods cause serious damage, and should be controlled or prevented; that the streams in the state are likely to be encroached upon by construction works, and that such obstructions should be allowed only under strict regulation; that in some cases where the water supply is insufficient for all purposes, it is the duty of the state to judge between the more important and the less important use; and that in the construction of dams, control and supervision are essential in order to prevent the creation of conditions which menace life and property. In its fundamental characteristics, existing legislation for the control of the waters of the state is not accidental or special, but arises out of a general need which will continue and will grow more and more pressing as the years pass.

It is to be assumed, of course, that if the state is to control its waters it must desire that this control be intelligent and effective. But it cannot exercise control intelligently and effectively in any particular case unless it is informed as to the facts and conditions which govern that case. Justice and efficiency in the control of water cannot be exercised in an abstract manner, but must consist in applying technical knowledge and common sense and fairness to the facts as they exist in any particular case. In case of most undertakings for the control of water, the facts which are important are not simply those which relate to conditions at any particular time, but must cover conditions existing through periods of many years. If the state is to rule intelligently on the length of spillway necessary to make a dam safe, if it is to advise a municipality on its available water supply, or if it is to regulate flood flows, it must base its work on the records of past conditions. If accurate records are kept year after year of the water resources of the state, the element of estimation and guess work will be reduced, and the element of certainty increased. The proper function of the Hydrographic Ser-

vice is to secure and put in available form these necessary records. The longer the periods these records cover, the better will they serve their purpose, and the more fully can they be relied upon. Records of five or ten or fifteen years, while very valuable, will not give all the information we need, for periods of extreme drought or extreme flood may occur at irregular intervals of fifty years or more.

If we can foresee what will be the future demands upon the waters of the state, and if we can tell what information we must have in order to know best how to meet those demands, we shall have the basis for a sound policy for the hydrographic service. It should not be the business of the hydrographic service to collect a miscellaneous lot of interesting information, but to foresee the needs of future developments, so that when these developments are undertaken, the records of stream flow and other information which may be necessary will have been secured, and will be readily available.

Let us suppose, for instance, that thirty or forty years from now a growing municipality requires an additional water supply. If in the meantime the hydrographic service has done its work well, this municipality will find most of its problems already solved. Maps will be available showing the streams which might be drawn upon for such a supply. The normal flow of available streams through long periods of years would be known, as well as the low water flow during the normal year, and the flow during periods of exceptionally dry years. In case storage should be necessary the records would indicate the flow during the wet period of the normal year, as well as the accumulated surplus of periods of wet years, which might be stored for use during periods of drought. Extreme flood flows would be known, so that storage dams could be constructed safely without undue expense, and the ground leakage and evaporation losses from reservoirs could be reasonably estimated. No amount of extra expense at that later date would entirely make up for the lack of accurate records kept through the intervening years. In case of other demands upon the waters of the locality, the hydrographic service would have foreseen the need of municipal water supply, and might have prevented the pollution of the water, or its appropriation for less important uses. In short, it should be the policy of the hydrographic service to have available such records that whenever any important use of water is undertaken, it can be undertaken intelligently and effectively. Reference to the more important uses will suggest what work should be undertaken by the hydrographic service.

DOMESTIC AND COMMERCIAL WATER SUPPLY

Water supply for domestic and commercial consumption probably

will overshadow every other use for water in the State as a whole. While some unforeseen turn of events may make radical changes in the distribution of population, yet we probably are justified in assuming that the centers of population will remain about where they are now. The hydrographic service will be justified in making intensive studies of water supply resources in drainage areas which might serve large cities, and in omitting intensive studies on watersheds which could not be put to such use. Where water resources and reservoir sites probably will be needed for municipalities, it should be the duty of the hydrographic service to watch these carefully and to guard against their being permanently appropriated for less important uses.

NAVIGATION

There are comparatively few possible canal routes through the state above tide water. In case a study of the various suggested routes indicates a scarcity of water at the summit levels for locking purposes, the establishment and maintenance of a comparatively few gaging stations at the critical points in time would furnish the information necessary for determining the sources of supply for canal purposes.

FLOOD CONTROL

In the case of streams of the state which present serious flood problems, the hydrographic service should concentrate its efforts to secure the stream flow data necessary for flood control. This should include measurements of flood flow, records of ice gorges, records of flood stages, and similar information. In many cases small streams are of major importance because they flow through thickly populated areas, and should be studied in detail. Other streams may experience large floods, but, because they do not pass through cities or villages of any importance, can be largely overlooked.

STEAM POWER DEVELOPMENT

If the recently inaugurated policy of developing electric power from low grade coal at the mines should be carried to a much greater length, it probably would be found that the limit of such developments would be due to the scarcity of water for steam and condensing purposes. Therefore, it may be very desirable to secure dependable records of stream flow throughout the bituminous coal regions.

WATER POWER

Whatever the future of water power developments in Pennsylvania may be, the hydrographic service would be delinquent if it should

not secure such records as would make possible the determination of the supply of water which might be made available in the more promising cases.

INDUSTRIAL WATER SUPPLY

Some of the largest water supply projects in the United States have been carried out in Pennsylvania for industrial purposes. Notably among these is the water supply of the Pennsylvania Railroad, and the system for supplying the Cambria Steel works. Where commercial developments indicate further need, the hydrographic service can secure such records as will make possible the best and least conflicting use of the supplies available.

FLOOD WARNING SERVICE

On streams subject to flood damage, a flood warning service can be installed at a very moderate expense. In some cases several days' notice of floods can be given, while in other cases even a few hours' notice may be sufficient for the protection of life and property. The completeness of this service should depend on the interests involved, being most thorough in highly developed industrial districts.

THE HYDROGRAPHIC SERVICE PROGRAM SHOULD BE BUILT AROUND SPECIFIC NEEDS

The above does not cover all the uses to which the waters of the state may be put. Moreover, new uses develop from year to year, so that a general knowledge of all the streams of the state is advisable. But the program of the hydrographic service should not be worked out to cover all the water sheds of the state uniformly. It should aim primarily to answer practical questions which the normal developments of the state will require to be answered. The hydrographic service should make a study of each important drainage area in the state, with the aim of determining what uses probably will be made of the waters of the drainage area, and the probable extent of such use. Such a survey or study should be the basis of the work of the service, and will enable its work to be carried on intelligently and effectively.

CHAPTER IV

STREAM GAGING, FLOOD WARNING AND PRECIPITATION

STREAM GAGING

During the water year from October 1, 1916, to September 30, 1917, the run-off of Pennsylvania streams was characterized by a distinct period of deficiency from October to May and an average above the normal from June to September. This followed closely the fluctuation in rainfall which was below the average during the first part of the "water year" and above during the latter part.

During the water year from October 1, 1917 to September 30, 1918, the run-off of Pennsylvania streams was about 5% less than the average. The flow during October, November 1917, February, March and September 1918 was above the normal, the greatest excess occurring in October, when the run-off was double the normal due to excessive precipitation, while the discharge for the remainder of the "water year" ending September 30, 1918 was below the average, the greatest deficiency occurring in January, when the run-off was only 12% of the average. This low flow was not due to a lack of precipitation, which was above the normal, but was the result of a long period of low temperatures. The above conclusions are based on the flow of the Susquehanna River at Harrisburg for 28 years and a fourteen year record of the Allegheny River at Kittanning.

Five new gaging stations were established; at Williamsburg on the Frankstown Branch Juniata River, Karthaus on the West Branch Susquehanna River, Cedar Run on Pine Creek, Sunbury on the Susquehanna River and Tyrone on the Little Juniata River. Two automatic gages were installed; one at Graters Ford on Perkiomen Creek and one at Olmsted's Mill on Yellow Breeches Creek.

The winters were unusually severe and the streams were ice bound for exceptionally long periods. In order that records of discharge might be continuous and authentic through frozen periods, current meter discharge measurements were made under cover of ice. The results obtained gave information from which, in conjunction with records of temperature and precipitation, reliable estimates of discharge were secured during abnormal channel conditions.

FLOOD WARNING 1917

During the first three months of 1917 the stages of the principal streams in Pennsylvania were frequently affected by the movements and gorging of ice. The streams became generally ice bound at low

stages during the latter part of 1916, and when the breaking of ice occurred there was not sufficient water to carry it away and conditions similar to those which caused the destructive floods of 1865, 1875, 1902 and 1904 prevailed.

Many of the gorges remained intact for weeks and caused the water to rise unusually high at several localities. However, prevailing warm weather weakened the jams and increased stream stages caused by rainfall and melting of accumulated snow gradually wore and carried away the ice fields without material damage.

There were no exceptional discharges in the streams during the year 1917. Those of importance, and a general resume of climatic conditions which caused them, are described on the following pages in chronological order and for the Susquehanna Basin there are tables showing the predicted and maximum stages which actually occurred at various gaging stations.

The temperature for March was slightly below normal and the precipitation of about 3.7 inches was slightly above the monthly average. The heaviest snowfall was 27.6 inches at Somerset with a minimum record, for the month, of 1.5 inches at Honesdale.

An ice gorge of considerable magnitude occurred in the West Branch Susquehanna River below Renovo on March 6th which raised the water surface about 9 feet and remained intact until the 9th of the month.

A slight precipitation accompanied by high temperature on March 11th and 12th affected materially the heights of streams in the Ohio and Susquehanna basins. The Monongahela reached flood stages while the Allegheny did not quite attain them. A gage height of 36.0 feet was recorded at South Brownsville and 16.2 feet at Kittanning which resulted in a stage of 23.1 feet at Pittsburgh.

In the Susquehanna Basin there was a rise of about 8 feet in the North Branch at Wilkes-Barre; 8.5 feet in the West Branch at Williamsport; 7 feet in the Juniata at Newport and 3 feet on the main Susquehanna at Harrisburg which was only a third of the rise ordinarily to be expected when using the factors commonly employed for the prediction of stages on the main Susquehanna below the mouth of the Juniata.

A study of the hydrographs reveals that the Juniata River at Newport and the West Branch Susquehanna River at Williamsport crested at practically the same time and that the maximum stage on the North Branch Susquehanna River at Wilkes-Barre occurred at about the same time the highest gage height on the main Susque-

hanna took place at Harrisburg, showing that the Juniata River was the principal factor in producing the Harrisburg crest and that the North and West branch flows followed that of the Juniata in the main stream, instead of augmenting it, which produced a long crest at Harrisburg extending over a period of nearly 24 hours.

The probable distributions of flood flows from large tributaries cannot be calculated by sterotyped methods and the effects which they have on large streams below their confluence are governed entirely by their time of arrival; as the prediction of these times is to a large extent a matter of personal judgment, great opportunities present themselves for making erroneous predictions, the tendency being to estimate too high stages.

The following table shows the stages predicted and those which actually occurred.

TABLE NO. XIII

Predicted and Actual Stages Reached March 12-14, 1917

Location	Stream	Predicted Stage	Maximum Stage
Corning	Chemung River	12.0	11.5
Binghamton	Susquehanna River, North Branch	5.0	5.7
Towanda	Susquehanna River, North Branch	8.0	9.0
Wilkes-Barre	Susquehanna River, North Branch	13.0	12.8
Danville	Susquehanna River, North Branch	11.0	10.2
Bower	Susquehanna River, West Branch	10.0	10.1
Clearfield	Susquehanna River, West Branch	5.0	5.5
Renovo	Susquehanna River, West Branch	9.0	8.6
Lock Haven	Susquehanna River, West Branch	5.0	15.0*
Jersey Shore	Susquehanna River, West Branch	13.0	Record lost
Williamsport	Susquehanna River, West Branch	12.0	11.6
Lewisburg	Susquehanna River, West Branch	10.0	9.5
Huntingdon	Juniata River, Frankstown Branch	10.0	9.0
Saxton	Juniata River, Raystown Branch	11.0	10.8
Newport	Juniata River	15.0	13.9
Harrisburg	Susquehanna River	11 to 12	10.5

Note—(*) Ice gorged

During this freshet an extensive ice gorge formed in the West Branch Susquehanna River at Lock Haven and maximum stages for the year were reached in the West Branch at Williamsport and in the Juniata River at Newport.

The highest stage for the year in the Schuylkill River occurred on the 12th of March and was a result of slight precipitation, averaging less than one half inch, accompanied by a high temperature which melted the accumulated snow on the upper reaches of the drainage basin. The river rose about 4 feet at Reading to a stage of 6.6 feet which was only 1.2 feet above the minimum annual high stage, 5.4 feet below flood stage and with but one exception the lowest yearly maximum height attained in 17 years.

Moderate amounts of precipitation occurred over the Susquehanna Basin on the 17th, 18th and 21st-24th of March with a decided increase in temperature during the latter storm, which resulted in another general rise of streams throughout the Susquehanna system, though its effects were much more marked in the North Branch than on the other tributaries. There was an increase of about 9 feet in the North Branch at Wilkes-Barre; 5 feet in the West Branch at Williamsport; 2 feet in the Juniata at Newport and 4 feet in the main stream at Harrisburg.

The predicted stages and those which actually occurred are shown in the following table.

TABLE NO. XIV

Predicted and Actual Stages Reached March 24-26, 1917

Location	Stream	Predicted Stage	Maximum Stage
Corning	Chemung River	8.0	7.8
Binghamton	Susquehanna River, North Branch	13.0	13.0
Towanda	Susquehanna River, North Branch	11.0	10.8
Wilkes-Barre	Susquehanna River, North Branch	15.0	15.4
Danville	Susquehanna River, North Branch	12.5	12.8
Bower	Susquehanna River, West Branch	9.0	8.8
Clearfield	Susquehanna River, West Branch	4.0	3.9
Renovo	Susquehanna River, West Branch	7.5	7.5
Lock Haven	Susquehanna River, West Branch	4.0	3.0
Jersey Shore	Susquehanna River, West Branch	12.0	Record lost
Williamsport	Susquehanna River, West Branch	11.0	10.4
Lewisburg	Susquehanna River, West Branch	9.0	8.3
Huntingdon	Juniata River, Frankstown Branch	7.0	6.3
Newport	Juniata River	9.0	8.2
Harrisburg	Susquehanna River	10 to 11	9.8

The stages on the North Branch Susquehanna River had scarcely started to subside when the effects of another storm on the 27th and 28th, averaging about 0.6 inch rainfall over the drainage basin, started another rise, the results of which, together with the stages predicted, are shown in the following table.

TABLE NO. XV

Predicted and Actual Stages Reached March 28-29, 1917

Location	Stream	Predicted Stage	Maximum Stage
Corning	Chemung River	8.0	7.8
Binghampton	Susquehanna River, North Branch	14.0	13.9
Towanda	Susquehanna River, North Branch	12.0	12.3
Wilkes-Barre	Susquehanna River, North Branch	18.0	17.7
Danville	Susquehanna River, North Branch	15.0	14.8
Harrisburg	Susquehanna River	10 to 11	10.8

A general storm over the Susquehanna Basin, on the 6th and 7th of June averaging about 1.2 inches of rainfall, caused a rise of about 7 feet in the North Branch at Wilkes-Barre; 6 feet in the West Branch at Williamsport; 5 feet in the Juniata at Newport and 4 feet in the main Susquehanna at Harrisburg.

The following table shows the stages predicted and those which were actually reached.

TABLE NO. XVI

Predicted and Actual Stages Reached June 7-9, 1917.

Location	Stream	Predicted Stage	Maximum Stage
Corning	Chemung River	10.5	10.3
Binghamton	Susquehanna River, North Branch	7.5	7.1
Towanda	Susquehanna River, North Branch	9.5	9.7
Wilkes-Barre	Susquehanna River, North Branch	14.0	13.0
Danville	Susquehanna River, North Branch	12.0	11.2
Bower	Susquehanna River, West Branch	10.0	9.3
Clearfield	Susquehanna River, West Branch	5.0	4.1
Renovo	Susquehanna River, West Branch	8.0	7.9
Lock Haven	Susquehanna River, West Branch	4.0	3.1
Jersey Shore	Susquehanna River, West Branch	11.0	Record lost
Williamsport	Susquehanna River, West Branch	10.0	9.6
Lewisburg	Susquehanna River, West Branch	8.5	8.3
Huntingdon	Juniata River, Frankstown Branch	8.0	7.5
Saxton	Juniata River, Raystown Branch	8.0	7.6
Newport	Juniata River	10.0	9.7
Harrisburg	Susquehanna River	9 to 10	8.9

A cloudburst of great intensity occurred at Dookers Hollow, in the Turtle Creek drainage area, on June 10th. Six inches of rain fell in 45 minutes which gave a rate of run-off equivalent to 3700 second feet per square mile. Three lives were lost, many people were injured and considerable damage was reported.

During the month of August cloudbursts were reported from several localities in the Susquehanna Basin and on the 8th, Lycoming County was swept by one of the worst wind and rain storms that had taken place for many years. Railroads sustained large amounts of damages caused by landslides, washouts and damaged bridges. On the 23d a rainfall of 3 inches in 3 hours was recorded at Harrisburg.

On August 7th-9th there was an average rainfall of about 2.9 inches over the North Branch Susquehanna River watershed area which caused the stream to rise rapidly. At Wilkes-Barre the stage increased from 4.5 feet to 14.5 feet in 10 hours.

The estimated stages and those which actually occurred are shown in the following table.

TABLE NO. XVII

Predicted and Actual Stages Reached August 9-11, 1917

Location	Stream	Predicted Stage	Maximum Stage
Towanda	Susquehanna River, North Branch	10.0	10.0
Wilkes-Barre	Susquehanna River, North Branch	14.0	14.5
Danville	Susquehanna River, North Branch	12.0	12.8
Harrisburg	Susquehanna River	7 to 8	7.3

Another August storm more general in character, over the Susquehanna Basin, though not particularly affecting the Juniata River took place several days later. Over the North Branch drainage area there was an average rainfall of about 1.0 inch upon a saturated soil which caused a rise of 5 feet in the river at Wilkes-Barre while an average precipitation of about 2.5 inches over the West Branch Basin resulted in a rise of only 6 feet at Williamsport.

The following table shows the stages predicted and those which were actually reached.

TABLE NO. XVIII

Predicted and Actual Stages Reached August 14-17, 1917

Location	Stream	Predicted Stage	Maximum Stage
Towanda	Susquehanna River, North Branch	8.0	7.7
Wilkes-Barre	Susquehanna River, North Branch	12.0	11.0
Danville	Susquehanna River, North Branch	10.0	9.6
Bower	Susquehanna River, West Branch	10.0	9.6
Clearfield	Susquehanna River, West Branch	5.0	4.8
Renovo	Susquehanna River, West Branch	8.0	6.9
Lock Haven	Susquehanna River, West Branch	4.0	3.0
Jersey Shore	Susquehanna River, West Branch	11.0	Record lost
Williamsport	Susquehanna River, West Branch	10.0	8.1
Lewisburg	Susquehanna River, West Branch	8.5	6.6
Harrisburg	Susquehanna River	7 to 8	7.1

It is interesting to compare this table with that of June 7-9, noting that on the West Branch the maximum stages reached at Bower were practically the same; that the predictions for the West Branch were identical and that resulting stages along the lower reaches were materially less, which exhibits an excellent example of the effects which large intermediate drainage areas have on the main stream stages and the unreliability of crest relation curves for such streams.

The average precipitation, from rain and melted snow, for the month of October, was about 6.4 inches, or nearly twice the normal amount. A noteworthy feature was the unusual amount of snowfall, which averaged 1.7 inches for the entire state, though there was little

or none observed in the southeastern counties. Amounts in excess of 2 inches were reported from 27 of the 116 Weather Bureau stations in Pennsylvania, the largest amount being 14.8 inches at Somerset which was 4.8 inches in excess of the maximum amount measured at any station in the state during the following month.

Three distinct storms occurred over the Susquehanna Basin during the latter part of October. Each succeeding storm increased in intensity over the North Branch drainage area, while the storm of the 23rd-25th exceeded the others, in amounts of rainfall, over the West Branch and Juniata basins.

The first storm which occurred on the 18th-20th averaged about 1.3 inches over the entire basin though its effects upon the Juniata River were practically negligible. There was a rise of about 5 feet in the North Branch at Wilkes-Barre and 7.5 feet in the West Branch at Williamsport which caused a rise of less than 2.5 feet in the main Susquehanna at Harrisburg.

The estimated stages and those which actually occurred are shown in the following table.

TABLE NO. XIX

Predicted and Actual Stages Reached October 19-22, 1917

Location	Stream	Predicted Stage	Maximum Stage
Towanda	Susquehanna River, North Branch	7.0	6.8
Wilkes-Barre	Susquehanna River, North Branch	10.0	9.5
Danville	Susquehanna River, North Branch	8.0	7.8
Bower	Susquehanna River, West Branch	9.5	9.3
Clearfield	Susquehanna River, West Branch	4.5	4.5
Renovo	Susquehanna River, West Branch	7.0	7.2
Lock Haven	Susquehanna River, West Branch	2.5	2.2
Jersey Shore	Susquehanna River, West Branch	9.5	8.5
Williamsport	Susquehanna River, West Branch	9.0	9.0
Lewisburg	Susquehanna River, West Branch	7.0	6.0
Harrisburg	Susquehanna River	6 to 7	6.2

The second storm which took place on the 23rd-25th was also general over the Susquehanna Basin and although it amounted to slightly more than the preceding one, its effects were much more marked owing to the partially saturated condition of the drainage areas.

There was an average rainfall of about 1.4 inches over the North Branch basin; 1.9 inches over the West Branch drainage area and 2.3 inches over the Juniata and its tributaries. The North Branch rose about 8 feet at Wilkes-Barre; the West Branch 6.5 feet at Williamsport; the Juniata 6.5 feet at Newport and the stage of the main Susquehanna was increased about 4 feet at Harrisburg which was only one half of what might have been expected had the discharges

from the three large tributaries reached the main stream simultaneously.

During this freshet the maximum stages at Williamsport and Newport took place at the same time and the crest stage at Danville occurred at the same time the maximum gage height was reached at Harrisburg, showing that the major portions of the North and West branch flows followed, rather than united with, the Juniata discharge.

The following table shows the stages predicted and those actually reached.

TABLE NO. XX

Predicted and Actual Stages Reached October 24-26, 1917

Location	Stream	Predicted Stage	Maximum Stage
Towanda	Susquehanna River, North Branch	10.0	9.8
Wilkes-Barre	Susquehanna River, North Branch	15.0	14.1
Danville	Susquehanna River, North Branch	12.0	11.9
Bower	Susquehanna River, West Branch	9.0	7.9
Clearfield	Susquehanna River, West Branch	4.0	4.0
Renovo	Susquehanna River, West Branch	9.0	8.8
Lock Haven	Susquehanna River, West Branch	4.5	3.6
Jersey Shore	Susquehanna River, West Branch	12.0	10.5
Williamsport	Susquehanna River, West Branch	11.0	10.4
Lewisburg	Susquehanna River, West Branch	9.0	9.3
Huntingdon	Juniata River, Frankstown Branch	7.5	8.0
Saxton	Juniata River, Raystown Branch	6.0	6.0
Newport	Juniata River	10.0	9.6
Harrisburg	Susquehanna River	8 to 9	9.5

The third storm which occurred on the 28th-30th gave an average rainfall of about 2.1 inches over the North Branch watershed area; 1.0 inch upon the West Branch drainage area and 0.8 inch over the Juniata Basin. There was a rise of about 7 feet in the North Branch at Wilkes-Barre while the West Branch and Juniata were not greatly affected, there being a rise of less than 2 feet at Williamsport and 3.5 feet at Newport.

The stages predicted and those which actually occurred are shown in the following table.

TABLE NO. XXI

Predicted and Actual Stages Reached October 30-31, 1917

Location	Stream	Predicted Stage	Maximum Stage
Corning	Chemung River	6.0	Not recorded
Binghamton	Susquehanna River, North Branch	13.0	13.3
Towanda	Susquehanna River, North Branch	11.5	11.3
Wilkes-Barre	Susquehanna River, North Branch	17.5	18.1
Danville	Susquehanna River, North Branch	14.0	16.4
Harrisburg	Susquehanna River	12 to 13	12.9

At the time of this high flow in the North Branch the crest stage at Danville took place 3 hours before the maximum height was reached at Wilkes-Barre and 7 hours before the highest gage height was reached at Towanda; Danville is about 52 miles below, or nearer the mouth of the stream, than Wilkes-Barre and about 131 miles below Towanda.

This was a phenomenal occurrence no similar incident having been recorded since the inauguration of the Flood Warning system and is accounted for by the unusual distribution of rainfall, there being about 3.2 inches in the vicinity of Danville, 1.8 inches at Wilkes-Barre and 1.2 inches at Towanda, which furnished sufficient run-off to cause the crest stages at Danville and Wilkes-Barre without aid of the ultimate discharge from above. Occasions of this nature are exceedingly rare; crest relations and time curves are of no value in the predictions of expected stages under such conditions, and no great flood would ever occur on main streams with such distributions of rainfall.

During this freshet the highest stage for the year was reached in the North Branch at Wilkes-Barre which was the highest October stage there, with but two exceptions, since 1891. The maximum stage for the year also occurred on the main Susquehanna at Harrisburg which was the highest October gage height, with but one exception, attained since 1874.

Excessive precipitation over the upper reaches of Delaware Basin, on the 30th of October, caused the East and West branches of the Delaware River to exceed flood stages but the intense rains seemed confined to comparatively small areas and flood stages were not reached along the main stream. The highest stage for the year occurred on the 31st, a gage height of 15.0 feet having been attained at Phillipsburg, N. J., which was, with but one exception, the lowest maximum stage that had occurred there since 1912, and, with but four exceptions, the lowest yearly maximum recorded for 13 years.

It was the coldest December that had occurred for thirty years, or since the establishment of the state weather service. The temperatures were below normal for twenty days or more during the month, with an average deficiency of 28 to 30 degrees during the last three days. The streams generally became ice bound on the 8th and were at low stages throughout the month.

FLOOD WARNING 1918

Exceptionally cold weather prevailed during the month of January and early part of February; the ice cover on streams attained great thickness and much fear, of what might be the results when ice movements occurred, was exercised by those living and possessing property along the principal streams.

During the middle of February higher temperatures melted large quantities of accumulated snow which caused a general breaking of ice on the Susquehanna Basin streams between the 13th and 15th, though there was not sufficient flow to carry away the enormous quantities of ice and frequent gorges occurred, the most extensive in the Susquehanna Basin being along the West Branch below Lock Haven and above Williamsport. Owing to prevailing ice conditions it was impossible to predict stages expected to occur; however, information relative to any movements of ice which were likely to endanger life or property was communicated to localities subject to damage.

On February 19th and 20th a rainfall averaging about one inch on the Susquehanna Basin had marked effects upon the stream flows. Along the North Branch stages were increased about 10 feet and the following table shows the estimated stages and those which actually occurred.

TABLE NO. XXII

Predicted and Actual Stages reached February 20-21, 1918

Location	Stream	Predicted Stage	Maximum Stage
Corning	Chemung River	15.0	14.3
Binghamton	Susquehanna River, North Branch	12.5	11.5
Towanda	Susquehanna River, North Branch	16.0	14.0
Wilkes-Barre	Susquehanna River, North Branch	22.0	17.5
Danville	Susquehanna River, North Branch	17.0	15.8

Owing to the ice packed condition of the West Branch in the vicinity of Jersey Shore it was expected that the increased flow would cause damage at that locality and probably at Williamsport; however, no damage was anticipated in the vicinity of Lock Haven. Nevertheless Jersey Shore and Williamsport escaped trouble and Lock Haven was badly inundated under most adverse circumstances. The gage height attained at Lock Haven from backwater, caused by gorging of ice, was 20.8 feet or within 3.0 feet of the height reached during the June flood of 1889, while the maximum amount of discharge which passed Renovo would not have been expected to give a stage of over 13.0 feet at Lock Haven.

The Commission reported a decidedly increased flow in the upper reaches of the West Branch at Jersey Shore and Williamsport late at night on the 19th. Inundations began to take place at Lock Haven during the afternoon of the 20th and no material relief was felt at that locality until the afternoon of the 21st. The river rose

rapidly at Jersey Shore on the 20th and reached a stage of 28.4 feet, being about 9.0 feet below the height of the 1889 flood, and receded rapidly in the evening when the gorge below that city broke. Williamsport was frequently informed of conditions above that city and advised that the large quantity of impounded water would not exceed a 22 foot stage at that locality if gorges did not occur below the city and the maximum height reached there was 21.4 feet.

On the Juniata River a stage of 10.0 feet was estimated for Huntingdon and 16.0 feet for Newport where heights of 10.2 and 13.9 feet respectively were reached. It was estimated that the Main Susquehanna at Harrisburg would not exceed a height of 15.0 feet and a stage of 14.2 feet was reached.

During the latter part of February comparatively small amounts of precipitation caused increased stages of 6 to 10 feet in the Susquehanna Basin.

The predicted gage heights and those which actually occurred are shown in the following table.

TABLE NO. XXIII

Predicted and Actual Stages reached February 26-27, 1918

Location	Stream	Predicted Stage	Maximum Stage
Corning	Chemung River	11.0	11.5
Binghamton	Susquehanna River, North Branch	10.0	9.9
Towanda	Susquehanna River, North Branch	12.5	12.0
Wilkes-Barre	Susquehanna River, North Branch	16.0	15.2
Danville	Susquehanna River, North Branch	14.0	13.3
Bower	Susquehanna River, West Branch	12.0	11.4
Clearfield	Susquehanna River, West Branch	7.5	6.5
Renovo	Susquehanna River, West Branch	11.0	10.2
Lock Haven	Susquehanna River, West Branch	8.0	7.8
Jersey Shore	Susquehanna River, West Branch	16.0	14.8
Williamsport	Susquehanna River, West Branch	14.5	15.0
Lewisburg	Susquehanna River, West Branch	12.5	13.1
Huntingdon	Juniata River, Frank town Branch	11.5	11.5
Newport	Juniata River	18.0	16.7
Harrisburg	Susquehanna River	13.0	13.6

On the first of March a moderate rainfall over the Chemung and upper North Branch basins caused increased stages of 4 to 8 feet. Those estimated and the ones which actually occurred are shown in the following table.

TABLE NO. XXIV

Predicted and Actual Stages reached March 1-3, 1918

Location	Stream	Predicted Stage	Maximum Stage
Corning	Chemung River	15.0	14.3
Binghamton	Susquehanna River, North Branch	12.5	12.2
Towanda	Susquehanna River, North Branch	16.0	15.0
Wilkes-Barre	Susquehanna River, North Branch	22.0	19.0
Danville	Susquehanna River, North Branch	17.0	15.5
Harrisburg	Susquehanna River	12.5	11.9

Ice gorged conditions along the North Branch below Binghamton probably augmented the gage heights at that locality which caused them to represent erroneous amounts of discharge.

The major portion of the March precipitation occurred at frequent intervals between the 4th and 14th of the month, being particularly pronounced on the latter date; however, the Juniata River was not materially affected. The North and West branches rose about 13.0 feet at Wilkes-Barre and Williamsport and there was a rise of about 9.0 feet in the Main Susquehanna at Harrisburg. The stages predicted and those which actually took place are shown in the following table.

TABLE NO. XXV

Predicted and Actual Stages reached March 14-16, 1918

Location	Stream	Predicted Stage	Maximum Stage
Corning	Chemung River	19.0	18.6
Binghamton	Susquehanna River, North Branch	10.0	9.9
Towanda	Susquehanna River, North Branch	16.0	16.8
Wilkes-Barre	Susquehanna River, North Branch	23.0	23.0
Danville	Susquehanna River, North Branch	19.0	18.5
Bower	Susquehanna River, West Branch	11.0	10.5
Clearfield	Susquehanna River, West Branch	6.0	6.2
Renovo	Susquehanna River, West Branch	13.0	14.0
Lock Haven	Susquehanna River, West Branch	12.5	11.3
Jersey Shore	Susquehanna River, West Branch	22.5	21.0
Williamsport	Susquehanna River, West Branch	20.0	19.1
Lewisburg	Susquehanna River, West Branch	17.5	17.1
Huntingdon	Juniata River, Frankstown Branch	8.0	7.7
Newport	Juniata River	10.0	9.1
Harrisburg	Susquehanna River	16.5	15.7

The precipitation for the month of April was 40 per cent in excess of the normal and about one half the amount fell between the 8th and 13th in the form of heavy snow which ran off in the Susquehanna Basin on the 16th and 17th, due to slight rainfall and high temperature. The following table shows the estimated stages and those which actually occurred.

TABLE NO. XXVI

Predicted and Actual Stages reached April 16-17, 1918

Location	Stream	Predicted Stage	Maximum Stage
Corning	Chemung River	12.0	11.0
Binghamton	Susquehanna River, North Branch	8.0	7.8
Towanda	Susquehanna River, North Branch	12.6	11.5
Wilkes-Barre	Susquehanna River, North Branch	18.0	18.2
Danville	Susquehanna River, North Branch	15.0	15.5
Williamsport	Susquehanna River, West Branch	12.0	11.1
Newport	Juniata River	15.0	14.1
Harrisburg	Susquehanna River	13.0	13.0

During the remainder of the year no unusual stages occurred in the principal streams of the Susquehanna Basin.

PRECIPITATION 1917-1918

Nine additional precipitation stations were established by the Water Supply Commission during the years 1917 and 1918 which are located at Camp Hill, Cumberland County; Harrisburg, Dauphin County; Jersey Shore, Lycoming County; Linesville, Crawford County; Steamburg, Crawford County; Trout Run, Lycoming County; Driftwood, Cameron County; Greenville, Mercer County, and Shanksville, Somerset County. The 33 stations established by the Water Supply Commission, two of which are located in Ohio, are described in the following table:

TABLE NO. XXVII

Precipitation Stations Established by Water Supply Commission

Location	County	Approximate Elevation	Established	Obeserver	Obeservations
Camp Hill	Cumberland	450	Nov. 1, 1917	Water Supply Commission	Twice daily
Carlisle	Cumberland	480	Jan. 1, 1916	C. E. Miller	Once daily, p. m.
Claridge	Westmoreland	1080	July 13, 1914 *	W. S. Kemerer	Twice daily
Cloe	Jefferson	1415	Nov. 18, 1913	Buffalo, Rochester & Pittsburgh Ry. Co.	Twice daily
Coatesville	Chester	490	Oct. 22, 1916	City of Coatesville	Twice daily
Creekside	Indiana	1105	Nov. 18, 1913	Buffalo, Rochester & Pittsburgh Ry. Co.	Twice daily
Cresson	Cambria	2215	Oct. 29, 1913	Cresson Sanitorium	Twice daily
Driftwood	Cameron	810	Jan. 1, 1918	E. E. Bradbury	Twice daily
Eagles Mere	Sullivan	2060	Dec. 1, 1913	E. S. Chase	Twice daily
Falls Creek	Jefferson	1495	Oct. 23, 1913	Buffalo, Rochester & Pittsburgh Ry. Co.	Twice daily
Graters Ford	Montgomery	120	Jan. 1, 1916	I. H. Smoyer	Twice daily
Greenville	Mercer	1000	Mar. 1, 1918	J. R. Homer	Onee daily, p. m.
Hadley	Mercer	1050	Jan. 1, 1914	Mrs. C. O. Powell	Once daily, a. m.
Harrisburg, E'ly. Sec.	Dauphin	405	July 13, 1914	Water Supply Commission	Twice daily
Harrisburg, N'ly. Sec.	Dauphin	320	Nov. 1, 1917	Water Supply Commission	Twice daily
Jersey Shore	Lycoming	570	Oct. 24, 1917	C. B. McCullough	Twice daily
Karthaus	Clearfield	830	Oct. 1, 1916	The New York Ceneral R. R. Co.	Twice daily
Ketner	Elk	1780	Nov. 18, 1913	Buffalo, Rochester & Pittsburgh Ry. Co.	Twice daily
Kinsman, Ohio	Trumbull	925	Jan. 1, 1914	A. B. Allen	Once daily, a. m.
Linesville	Crawford	1060	Jan. 1, 1917	Mrs. Guy H. Thomas	Once daily, a. m.
North Shenango +	Crawford	1110	Feb. 25, 1912	Mrs. H. M. Patterson	Once daily, a. m.
Murrysville	Westmoreland	900	July 14, 1914 *	James Cruikshank	Twice daily
Pennline ++	Crawford	1030	Dec. 1, 1914	Miss Retta Crumb	Once daily, a. m.
Shanksville	Somerset		May 1, 1918	David Weigle	Twice daily
Steamburg	Crawford	1080	Jan. 1, 1917**	Paul A. Lawrence	Once daily, a. m.
Summit	Crawford	1150	Jan. 24, 1914	L. E. Dickey	Once daily, a. m.
Trafford	Westmoreland	800	July 13, 1914 *	A. Hackenbery	Twice daily
Transfer	Mercer	1020	Feb. 4, 1914	Miss Helen Polley	Once daily, a. m.
Trout Run	Lycoming	725	July 23, 1917	Miss Orpha Apker	Twice daily
Turnerville	Crawford	1045	Feb. 27, 1912	S. A. Marvin	Once daily, a. m.
Union City	Erie	1200	Dec. 29, 1913***	Department of Fisheries	Twice daily
Westford	Crawford	1100	Nov. 13, 1913	C. C. Collins	Once daily, a. m.
Williamsfield, Ohio	Ashtabula	1080	Jan. 1, 1914	Mrs. Kate Leonard	Once daily, a. m.

* Discontinued August 31, 1915 ** Discontinued February 16, 1918 *** Discontinued August 31, 1916

\+ Published in 1917 Report as Linesville No. 1

++ Dec. 24, 1913, to Nov. 30, 1914, inclusive, this station was located at Padanaram, Ohio

The daily, monthly and annual precipitation observed at the Water Supply Commission stations from dates of establishment to December 31, 1916, inclusive, were published in Table No. 15, pages 62-95 of the 1915 Report and Table No. 9, pages 47-59 of the 1916 Report.

The daily, monthly and annual precipitation observed during the years 1917 and 1918 are shown in the following tables:

TABLE NO. XXVIII

Daily, Monthly and Annual Precipitation for 1917
Daily Precipitation for January 1917

Station	Day of Month																													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Carlisle	T		.36		.55				.04	T			1.50		.36						1.20				.11			.04	.21		.03	4.40
Cloe	.04		.42		.45	.11			.07	.04		.03	.09	.41	.04			.07			.57	.93			.03			.02	.03	.04		3.39
Coatesville			.40	T	.30	.06			T				.10	.85	.10							1.40			.01			.10	.40	.12		3.84
Creekside	.10		.54		.50								.22	.12	.10			.10			.25	.80			.07			.10				2.90
Cresson	.01		.52		.54				.03	.03			.10	.40	.15			.04			.65	1.01		.03		.04		.06		.05		3.66
Eagles Mere			*	*	1.02				.04				2.02															.22				3.30
Falls Creek	T	.06	.25	.05	.34	.25		T	.11	.02	.04	T	T	.72	.01	.02		.06	.03	.01	.27	1.00			T	.03		.05		.03	.02	3.37
Graters Ford			.32			.37				.06				1.02		.23						1.28			.04			.11		.45		3.88
Hadley	.08	.03			.50	.15				.20		.06	.03	.72				.06	.02			.37					.02	.04				2.28
Harrisburg	T		.32		.57				.09				.09	1.38	.25						.53	.67		T	.03	.01	T	.06	.19		T.	4.19
Karthaus			.25		.58										.15						.26					.05						1.29
Ketner	T		.20	.02	.46				.10	.05			.05	.33				.12	.10		.22	.58	T			.04	T	.02	.03	09	.01	2.42
Kinsman	T		.38	T	.58	.28			.11	.02	.04		.04	.36				.06	.06			.39				.12				.04		2.48
Linesville, 1			.24	.03	.54	.22				.21		.03	.01	.36				.06	.02			.38	T			.10						2.20
Linesville, 2			.24	.03	.54	.22				.15	T		.03	.60				.20	.29		.17		.16			.02						2.65
Pennline	.05	.03	.19		.51	.28				.16	.03	.02	.04	.35				.03	.03			.50	.02			.12				.04		2.40
Steamburg	.02	.24			.72	T				.17	.05	.03	.02	.72				.26	.03			.32	.09			.20				T		2.87
Summit	.02	.24			.72	T				.15	.05	.06	.02	.60				.26	.03			.32	.03			.15						2.65
Transfer	.05	T		.03	1.14	T				.17		T	.04	.78					.01			.48				.06		T	T	.05		2.81
Turnerville	.05	.03	.28	.02	.58	.16				.18	.03	.08	.03	.30				.06	.02		.08	.36	.01			.10						2.43
Westford	.05		.25		.64	.04				.17	T	.06	.02	.48		T		.13	T		.17	.24	T			.10				.02		2.37
Williamsfield		.08	.25		.74					.18			.02	.30				.06	.06			.37				.12				.04		2.22

*Precipitation included in the next following measurement

Station	Day of Month																												Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Carlisle				.11					T.	T.					.20	.09				.05		.35	.42			.01	T.	.55	1.78
Cloe	.33			.07					.05							.03							.35	.19		.06	.04		1.12
Coatesville	T.				.20											.13	T.			.07		.13	.21	.10	T.	T.	.02	.56	1.42
Creekside	.08			.10					.08							.10							.15	.07			.07		0.65
Cresson	.14	.03	.02	.22						.02	.02					.10							.27	.33			.05	.20	1.40
Eagles Mere				*	.37				.19								.16					.13		.27					1.12
Falls Creek	.01	.04	.08	.05	.04	.06	.07	.03	.16	.02			T.	.01				.01	.02	.10		.08	.24	.13		T.	.20	T.	1.35
Graters Ford					.04											.14				.13		.33		.32			.01	.77	1.74
Hadley		.02		.08	.15			.02	.24				.02	.02			.02			.20				.25			T.		1.02
Harrisburg	.02	T.			.03		T.		.04		T.					.17			.02	.08		.20	.23	.15				.50	1.44
Karthaus				.15																		.20	.15				.10		0.60
Ketner	.29	T.	.01	.15	.04		.02	.01	.21	.01						.07	.01		.04	.08		.07	.28	.04		.12	T.		1.45
Kinsman	.02	.02			.21	T.			.24	.02	T.			.06		.01	.03			.11				.26			T.		0.98
Linesville, 1	.12	.02	.10	.10	.13				.12	.02				.02			.05			.18				.22					1.08
Linesville, 2	.17		.02	.25	.42		.02		.40	.04					T.								T.						1.32
Pennline	.02	.06	.11	.10	.15		.04		.17	.02				.02			.03			.16		.03		.25					1.16
Steamburg		T.	T.	.20	.13	.40	.04		.40	.03							.03			.15		T.		.22					1.60
Summit		.04		.15	.09		.06		.50	.10						.01	T.			.14				.13					1.02
Transfer				T.	.13	T.	T.		.08			T.					T.			.15				.21					0.57
Turnerville	.01	.01	.01	.10	.21	.01	.02		.28	.04		.01		.02		.01	.05			.14				.33			.01		1.26
Westford	.09	.02	.01	.10	.13	T.	.02		.15	.02	T.	T.		.02		.02	T.			.11		T.		.23			T.		0.94
William field	.10			.12	.06				.20					.06		.01	.03			.10				.24					0.92

*Precipitation included in the next following measurement

Daily Precipitation for March 1917

Station	Day of Month																														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Carlisle	.10	.42	T.	.70	.48	.04		.12			.12			.55			.42	.02			.27		.59				.16		.02			4.01
Cloe		.06	.07	.63	.28						.21			.42			.35				.22	.09	.36	.29			.17		.06			3.21
Coatesville	.04		.36	.86	.38			.38			.02			.20	T.		.38				.13	.30	.10	.39			1.10					4.64
Creekside		.06	T.	.20	.18									.40			.10				.20		.10	.07			.15		.08			1.54
Cresson	.15	.14		.80	.53			.13	.05		.07	.15		.22			.23	.10	.02		.25		.38	.28			.19	T.	.20			3.89
Eagles Mere		.15		*	.90						.28			.26	.07		.30				.08		.03				.75				.09	2.91
Falls Creek			.26	.20	.43			.08	.08		.35	.01	.02	.29			.37	.07	.04		.07		.21	.38			.12	.14		.05		3.17
Graters Ford			.34		1.16		.42				.26	.04			.20			.40				.25		.55				.93	T.			4.55
Hadley		.01			.25	.05		.30	.02		.32	.07		.21	.02		.10	.07	.20			.01		.58				.10	.11			2.42
Harrisburg			.34	.39	.81			.17	T.		.04	.01		.49			.46	.01	.01		.18	.06	.32	.36			.52	.02	.01			4.20
Karthaus				.60	.50												.36					.32										1.78
Ketner		.02	.05	.00	.27			.08	.03		.45	T.		.34	T.		.34	.02			.15	.05	.34	.23			.24	.16	.15		T.	3.01
Kinsman			T.		.38	T.		.26	.04		.40	.03		.07			.16	.04	.21		T.			.44				.25	.11			2.39
Line ville, 1					.26	.06		.23	.06		.44	.12		.25			.21	.13	.03			.03		.52				.15	.16			2.68
Linesville, 2					.22	.06		.24			.80			.24			.24	.10	.06			.10		.52				.18	.18			2.94
Pennline					.18	.06		.24	.05		.61	.15		.33		T.	.28	.07	.16					.53				.22	.17			3.05
Steamburg					.31	.20		.26	T.		.74	.15		.16	T.	T.	.26	.05	T.					.49				.19	.11			2.92
Summit					.22	.03		.20	.03		.85	.04		.30			.16		.03					.48					.16			2.51
Transfer			T.		.25	T.		.04	T.		.75	.02		.24				.10	.20					.52				.26	.11	T.		2.49
Turnerville					.29	.01		.22	.02		.50	.08		.14			.15	.07	.11					.53				.24	.10			2.46
Westford					.25	.03		.21	.02		.47	.04		.15			.23	.09	.12			.06		.46				.22	.13			2.48
Williamfield					.30			.18	.12		.46			.14			.23	.10	.15					.46				.21	.11			2.46

*Precipitation included in the next following measurement

Daily Precipitation for April 1917

Station	Day of Month																														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Carlisle		.03			1.28	T.		.12										T.	.25		.05			.12		.14					1.99
Cloe		.33			.87	.60													.22	.36	.21					.34					2.93
Coatesville					.41	.90			.38				.05							.05	.27			.02		.09		T.			2.17
Creekside		.10			.20	.25													.44					.02		.22				.05	0.75
Cresson		.42			.78	.81	.02	.20											.07									.18			2.96
Eagles Mere		.22			*	1.26							T.		T.				.19	.22	.20						.20				1.73
Falls Creek		.23			.73	.20														.17	.11	.10		T.		.16					1.97
Graters Ford						.90			.36									.06	.30	.15	.08			.13		.42				.03	1.80
Hadley	.15	.24	.10			.66	.20			*		T.							.01	.27	.12		T.	.13		.12	.02		T.		2.52
Harrisburg		.01			.58	.90			.12												.15					.20					2.28
Karthaus														.20												.12				.05	0.55
Ketner		.22			.23	.64	.01					T.			T.	.01			.15	.15	.13				T.	.50	T.			T.	1.71
Kinsman	.31	.25	.14		T.	.77	.07								T.			.08	.28	.08	.02									.04	2.50
Linesville, 1	.65	.32	.12			.83	.16					.01	T.	.02		.01		.01	.44	.09	.02			.05		.31	.03			.06	3.08
Linesville, 2	.66	.38	.08			.25	.10	.07				T.			.02				.61	.06	.03			.04		.35	T.			.05	2.60
Pennline	.51	.32	.15			.82	.13					.02			.02	T.			.44	.04	.01					.32	.01			T.	3.09
Steamburg	.40	.39	.17		T.	.32	.20												.35	.45						.38					2.34
Summit	.51	.45	.32			.16	.20												.38	T.	.11			T.		.40				T.	2.82
Transfer	.15	.24	.07		T.	.66	.21			T.								.02	.53	.37	.07			.12		.24	.01				2.22
Turnerville	.26	.24	.08			.89	.13								.02				.50	.10	.02		.02	.09		.21	.03			.07	2.96
Westford	.33	.26	.13			.78	.15												.42		.05			.13		.22				.07	2.71
Williamsfield	.28	.32	.18			.76	.15																								2.58

*Precipitation included in the next following measurement

Daily Precipitation for May 1917

Station	Day of Month																														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Carlisle	.37			.56	.11		.07	.04	.02			T.						.02		T.		.47			.01		T.	.47	.36		T.	2.50
Cloe	.18			.39	.41	.06	.10	.30	.03									.08		.22		.30	.23					.73	.23			3.26
Coatesville	.12			.47	.34	.01	T.	T.	.22										.15			.11	.17				T.	1.25	.15			2.99
Creekside	.07			.10	.20	.08	T.	.08	.12									T.					.10					.20	.20			1.15
Cresson	.10	.01		.57	.36		.07	.36	.09			T.		.11							.03	.37	.12		.06	.02	.03	.75	.18	.40		3.63
Eagles Mere	.20				*	.63				.95	.03												.52					.35	.82		.15	3.65
Falls Creek	.20				.70	.10		.10		.10									.20		.30	.10	.40	.30	.10	.10	.10	.10	.70	.40		4.00
Graters Ford		.16			.79	T.				T.								.07		T.		.01	.46					.25	1.63			3.37
Hadley	.07				.79	.09	.35	T.	.06										.15	.70		.50	.33	T.	.02		.50	.10	.25	.05		3.96
Harrisburg	.34			.20	.31	.02	T.	.01	T.			T.	.01					.01			T.		.25	T.			T.	.83	.52			2.50
Karthaus				.40	.23		.36	.20	.25										.10									.46	.26			2.26
Ketner	.10			.15	.75	.30	.10	.10	.50				.01					.44		.56		.88	.10	.10	.10		.36	.42	.16		.02	5.15
Kinsman	.17	T.			.74	T.	.22		.12								T.	.11	.02			.22	.29		.09		.49	.04	.72	T.		4.13
Linesville, 1	.21				1.20	.30	.21	.04	.14			.03							.24	1.00		.27	.34	.06	.37		.42	.23	.41	.07		5.54
Linesville, 2	.12	.05			.99	.22	.17		.14			.06						.01	.22	.90		.21	.30	.03	.48	T.	.41	.18	.45	T.		4.94
Pennline	.12	.05			.70	.16	.22	.02	.13			.06						.01	.17	.77	.06	.28	.49	.02	.48		.35	.18	.74	.02		5.03
Steamburg	.16				.95	.22	.26		.10	.11		.07						.01	.26	.94		.25	.36	.31	.37		.79	.18	.75	.15		6.24
Summit	.21				.88	.21	.29			.29		.09							.26	.85		.29	.52		.72		.33	.19	.66	.02		5.81
Transfer	.55		T.		.78	.04	.23	T.	.11	T.								T.	.24	.33		.62	.31	T.	.10	T.	.24	.23	.42			4.20
Turnerville	.10	.02			.86	.17	.16	.03	.08			.02							.23	1.11		.22	.27		.20		.45	.03	.58	.04		4.57
Westford	.11	.05			.82	.13	.18	.04	.07			.03							.15	1.10	.02	.25	.28	T.	.27		.44	.18	.50			4.62
Williamfield	.01	.03			.83	.13	.12		.05									.02	.13	.90		.28	.47		.17		.43	.34	.68			4.59

*Precipitation included in the next following measurement

Daily Precipitation for June 1917

Station	Day of Month																													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Carlisle	.18	.15	.03	----	.58	.70	.37	.04	.02	T	.14	.02	----	----	.06	----	----	----	----	.01	.03	.02	----	.72	----	----	----	----	.25	------	3.32
Cloe	.54	----	.30	----	.40	.45	.51	.09	----	.14	----	----	----	----	.38	----	----	----	----	----	----	----	----	.69	----	.08	1.39	----	.46	------	5.43
Coatesville	.55	.19	T	----	.27	.02	1.03	----	----	.32	1.05	.03	----	1.38	.02	.03	----	----	----	----	----	----	----	.15	----	----	.02	----	------	------	5.06
Creekside	.20	----	.10	----	.10	.28	.10	----	----	.24	----	----	----	T	.12	----	----	----	----	----	----	----	.08	.40	----	----	.10	----	.13	------	1.85
Cresson	.16	.23	.20	----	.20	.59	1.64	.20	.02	.35	----	----	----	----	.24	----	----	----	----	----	----	----	.55	.22	----	.31	.28	.41	.10	------	5.70
Eagles Mere	----	.55	----	----	.38	.22	.20	----	----	.57	----	.32	----	----	.05	.28	----	----	----	.38	----	----	1.02	----	----	.80	----	----	.13	.31	5.21
Fails Creek	.10	----	----	----	.40	.40	.80	.10	.40	.20	----	----	----	.10	.10	----	----	.10	----	----	----	.20	----	.80	----	.20	1.20	----	.90	------	6.00
Graters Ford	.10	.11	T	----	----	.22	.89	----	T	.63	T	1.53	----	.92	.01	----	----	----	----	----	.04	----	----	.05	----	----	.32	----	------	.09	4.91
Hadley	.55	----	.02	----	.12	.32	.62	.15	1.50	1.10	----	----	----	.26	T	.17	----	----	T	.15	----	----	----	.50	----	----	1.10	----	1.20	.20	7.96
Harrisburg	.26	.64	.13	----	.68	.13	.23	.17	----	.03	.02	----	.04	T	.01	.04	----	----	----	----	----	----	----	.46	----	----	----	----	.55	------	3.54
Karthaus	----	----	----	----	----	.60	.46	----	----	.80	----	----	----	----	----	----	----	----	----	.07	.06	T	.02	----	----	----	----	.10	------	.10	2.18
Ketner	.76	----	.01	----	.60	.30	1.65	.10	.09	1.84	----	----	----	.02	.12	.02	----	.08	----	----	----	.12	----	----	----	----	----	----	----	------	8.84
Kinsman	.58	----	.27	----	T	.21	.47	.16	2.26	.90	T	----	----	.28	T	.09	----	T	----	----	----	----	.04	.80	----	.25	1.85	----	.31	------	7.38
Linesville, 1	.63	----	.06	----	----	.42	.73	.27	.58	1.10	----	----	----	.32	.06	----	----	----	.07	.12	----	----	.06	.67	----	.31	.35	----	.28	.23	6.26
Linesville, 2	.46	T	.05	----	.07	.38	.29	.24	.65	1.02	.02	----	----	.38	.03	.03	----	.04	.05	.24	.02	----	T	.89	----	.28	.18	----	.19	.07	5.58
Pennline	.69	----	----	----	.16	.18	.83	.13	.05	.30	.04	----	----	.37	----	.05	----	.07	.01	.11	.14	----	----	.60	T	.20	.46	----	.20	.11	4.70
Steamburg	.87	.02	----	----	T	.34	.55	.22	----	.35	.05	----	----	.37	T	----	----	.50	----	T	----	----	----	.85	----	.30	.60	----	.18	T	5.20
Summit	.57	----	----	----	----	.43	.20	.15	----	.75	.02	----	----	.67	----	.02	----	----	.10	.13	.05	----	----	.51	----	.52	1.01	----	.05	.14	5.32
Transfer	.57	----	----	----	.20	.64	.97	.11	.63	.46	----	----	----	.32	T	T	----	----	----	T	----	----	.47	.08	----	----	.68	----	.85	.25	6.23
Turnerville	.46	.01	.33	----	----	.22	.49	.18	.40	.74	.14	----	----	.26	----	.12	----	.01	.01	.05	----	----	.04	.58	----	.39	.23	----	.41	.24	5.31
Westford	.45	----	.05	----	.07	.30	.60	.20	.21	1.18	----	----	----	.30	----	.10	----	.01	----	.05	----	----	T	.08	----	.32	.26	T	.19	.60	5.97
Williamsf'd	.50	----	.08	----	.10	.43	.35	.20	.22	.88	----	----	----	.35	----	.09	----	----	----	.38	----	----	----	.56	----	----	.78	----	.18	.15	5.25

Daily Precipitation for July 1917

Station	Day of Month																														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Carlisle	----	----	----	----	----	----	----	.10	1.10	1.50	.48	.25	.01	.32	.11	1.02	.02	.14	.43	----	----	T	----	----	----	.02	----	----	T	----	----	5.50
Clce	----	.49	----	----	----	----	----	.52	.73	.18	----	.30	.10	.23	----	.31	.33	----	1.04	.17	.60	.11	----	----	----	----	.10	----	----	----	----	5.21
Coatesville	----	1.05	.24	T	----	T	----	.03	.74	1.34	.12	T	----	.17	.05	----	.35	.03	T	T	T	----	----	----	----	.12	T	----	T	----	----	4.24
Creekside	----	.20	----	----	----	----	.15	.20	.10	1.20	----	----	.10	----	----	.12	.15	1.20	----	1.30	.40	.60	----	----	----	----	.20	----	----	----	----	5.92
Cresson	----	.06	----	----	----	.15	----	.45	.42	.49	.09	----	----	.19	.08	.27	.12	----	----	----	.33	.36	----	----	.15	----	----	----	----	----	----	3.16
Eagles Mere	.19	.01	----	----	----	----	----	----	1.03	.28	.91	.04	----	.60	----	.01	----	1.60	----	----	----	.11	.15	----	----	----	----	----	.62	----	----	5.55
Falls Creek	.10	.10	----	----	----	----	----	.60	.40	.30	.20	----	.10	.10	.40	.50	.20	.20	----	----	----	----	.20	----	----	----	1.30	----	.10	----	----	4.80
Graters Ford	----	.82	1.98	----	----	----	----	T	----	2.67	----	.04	----	.10	.17	----	.30	.11	.02	----	----	----	----	----	----	----	----	----	.11	----	----	6.32
Hadley	----	.30	----	----	----	----	----	.25	----	.76	T	----	.12	.27	.95	----	.10	.20	.32	----	----	----	.15	----	----	----	.10	----	----	----	----	3.52
Harrisburg	----	----	----	----	----	----	----	.25	.83	.16	.34	.38	----	.22	.13	----	.93	.06	.12	----	----	----	----	----	----	.04	----	----	T	----	----	3.46
Karthaus	----	----	----	----	----	----	----	.06	.10	.08	.12	.80	.20	.40	----	----	----	.25	.18	----	----	----	.08	----	----	1.20	----	----	----	----	.06	3.53
Ketner	.15	.30	.01	----	----	----	----	.45	.38	.10	.08	.01	.44	.27	.45	.02	.41	.22	.10	----	.43	----	----	----	----	.74	.24	----	----	----	----	4.80
Kinsman	.47	----	----	----	----	----	----	.43	----	1.12	.04	T	.04	.14	1.57	----	.06	.13	T	.25	----	----	----	T	----	----	.76	----	----	----	----	5.01
Linesville, 1	----	.41	----	----	----	----	----	.21	----	1.40	.37	----	----	.15	.67	----	----	.55	.33	.25	----	----	----	----	----	----	.14	----	----	----	----	4.48
Linesville, 2	----	.80	----	----	----	----	----	.23	T	.99	.16	----	----	.09	.71	----	.49	----	.09	----	----	----	.05	----	----	----	.02	----	----	----	----	3.63
Pennline	----	.67	----	----	----	----	----	.33	T	1.19	.51	T	----	.09	.46	----	----	.04	----	.12	----	----	----	----	.08	----	.07	----	----	----	----	3.56
Steamburg	----	.90	----	----	----	----	----	.63	T	1.11	.34	----	----	.34	.60	----	----	.38	----	.40	.17	.12	----	----	1.24	----	.12	----	----	----	----	6.35
Summit	----	.59	----	----	----	----	----	.86	----	1.61	----	.35	----	.10	.34	----	.47	----	----	.08	----	----	----	----	.10	----	.06	----	----	----	----	4.56
Transfer	----	T	----	----	----	----	----	.36	.05	1.23	----	----	----	.29	1.28	.39	.30	.06	.66	----	----	----	----	.33	----	.50	.40	----	----	----	----	5.85
Turnerville	----	.67	----	----	----	----	----	.26	.01	.98	.04	.06	----	.16	.34	----	.01	.57	----	.13	----	----	----	----	----	----	.40	----	----	----	----	3.63
Westford	----	.68	----	----	----	----	----	.33	----	1.06	.08	----	----	.10	.70	----	.02	.30	.34	.24	----	----	----	----	----	----	.22	----	----	----	----	4.07
Williamsfield	----	.74	----	----	----	----	----	.27	----	1.70	.12	.02	----	.08	1.08	----	----	.52	----	.52	----	----	----	----	----	----	.28	----	----	----	----	5.33

Daily Precipitation for August 1917

Station	Day of Month																													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Carlisle	----	.68	----	----	----	.58	T	1.62	.29	----	.40	----	.10	----	.16	T	----	----	----	----	----	----	.77	----	----	----	----	----	2.04	.09	.34	7.07
Clce	----	----	----	----	----	.28	----	1.06	.34	----	----	----	.47	1.68	----	----	----	----	----	----	.08	----	.53	----	----	----	----	----	.16	.80	----	5.40
Coatesville	.24	----	T	----	----	----	.05	----	.19	----	.13	----	----	----	----	----	----	----	----	----	----	----	.05	.48	----	----	----	----	----	.28	T	1.42
Creekside	----	----	----	----	----	----	----	----	.20	----	----	----	----	.60	----	----	----	----	----	----	----	----	.40	.10	----	----	----	----	.14	.60	----	2.04
Cresson	----	.30	----	----	----	.03	----	.30	----	----	.07	----	1.40	.31	----	----	----	----	----	----	----	----	.93	----	----	----	----	----	.16	.30	----	3.80
Eagles Mere	----	----	----	----	----	----	.06	.18	1.70	----	.09	----	4.30	----	----	.43	----	----	----	----	----	----	----	1.96	----	----	----	----	.52	.07	----	9.31
Falls Creek	----	----	----	----	----	----	----	.90	.20	----	----	----	.70	1.50	----	----	----	----	----	----	----	----	.10	.20	----	----	----	----	----	.40	----	4.00
Graters Ford	----	----	----	----	----	----	.01	.04	.34	----	----	----	----	----	----	----	.03	----	----	----	----	----	----	1.06	----	----	----	----	----	.09	.90	2.47
Hadley	----	----	----	----	----	----	----	----	.10	.30	----	----	----	1.00	----	----	.12	----	----	----	----	----	----	1.00	----	.19	----	.07	.02	.20	----	3.60
Harrisburg	.16	.58	----	----	----	.71	----	.03	2.56	----	----	----	T	T	.30	T	----	----	----	----	----	----	3.73	.28	----	----	----	----	----	.23	----	8.58
Karthaus	----	----	----	----	----	----	----	.80	----	----	----	----	----	1.75	.20	----	----	----	----	----	----	----	.20	----	----	----	----	----	----	1.30	----	4.25
Ketner	----	----	----	----	----	----	----	.35	.26	----	----	----	.75	1.83	1.18	----	----	----	----	----	----	----	.10	.03	.04	----	----	.12	.04	.29	----	4.99
Kinsman	----	----	----	----	----	----	----	T	T	.11	----	----	----	.96	----	----	T	----	----	----	----	----	.31	.84	.12	.09	----	.09	.16	.22	----	2.90
Linesville, 1	----	----	----	----	----	----	----	----	----	----	----	----	----	1.24	----	----	.24	----	----	----	----	----	.53	1.20	.34	.12	----	----	1.40	.26	----	5.33
Linesville, 2	----	----	----	----	----	----	----	----	----	.03	----	----	----	1.00	----	----	.22	----	----	----	----	----	.69	1.10	.23	.03	----	.07	1.25	.23	----	4.85
Pennline	----	----	----	----	----	----	----	----	----	.02	----	----	----	.33	----	----	.27	----	----	----	----	----	.94	1.71	.16	.02	----	.05	1.10	.16	----	4.76
Steamburg	----	----	----	----	----	----	----	----	----	----	----	----	----	.33	----	----	.31	----	----	----	----	----	1.18	.87	.24	.16	----	.60	1.09	.16	----	4.94
Summit	----	----	----	----	----	----	----	----	----	----	----	----	----	.45	----	----	.27	----	----	----	----	----	.78	.71	.21	----	----	.15	1.40	.30	----	4.27
Transfer	----	----	----	----	----	----	----	.03	.05	----	----	----	----	1.05	----	----	----	----	----	----	----	.08	.47	.08	.09	.08	----	.03	.08	.25	----	2.29
Trout Run	.66	----	----	----	----	----	----	T	1.51	----	----	----	----	1.20	----	----	.05	----	----	----	----	----	.06	----	----	----	----	----	.50	.26	----	4.24
Turnerville	----	----	----	----	----	----	----	.03	.01	.08	----	----	----	1.27	----	----	.04	----	----	----	----	----	.43	.18	.09	.06	----	.12	.24	.22	.01	2.78
Westford	----	----	----	----	----	----	----	----	----	----	----	----	----	1.01	----	----	.10	----	----	----	----	----	.60	.26	.48	.04	----	.12	.90	.23	----	3.74
Williamsfield	----	----	----	----	----	----	----	----	----	----	----	----	----	.35	----	----	----	----	----	----	----	----	.62	.61	.42	.05	----	.13	.18	.20	----	2.56

Daily Precipitation for September 1917

Station	Day of Month																													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Carlisle	.14					.68		2.06							.78						.53							.27		T	4.46
Cloe		.13				.55		.75																				.20		.11	1.74
Coatesville	.78	.03				.11		1.01	T						1.10	T					.01				T			.25			3.29
Creekside						.70		.60													.20										1.50
Cresson	.02					.98		2.13	.02						.02													.16		.07	3.40
Eagles Mere	.08	.10				.08		.51																			*	.25		.24	1.26
Falls Creek						.60		.90																				.30		.20	2.00
Graters Ford			T			.09		1.00							.34													.28			1.71
Hadley						1.00		.15											.90									.25		.10	2.40
Harrisburg	.09	1.36	.01			.29		1.74							.73						.08	.16						.42			4.88
Karthaus								.80																							0.80
Ketner	.12	.25				.28		.28												.21								.20		.25	1.59
Kinsman				T		1.69		.56											.46	T	T							.21		.28	3.20
Linesville, 1			.23			.51		.31												.14								.27		.22	1.68
Linesville, 2		.33				.83		.22											.18	.03		.02						.23		.34	2.18
Feanline			.19			.78		.20											.23	.13								.31		.20	2.04
Steamburg			.25			.57	.20	.18											.21	.11	T							.24		.19	1.95
Summit			.27			.70		.22											.41									.35		.39	2.34
Transfer			T			1.87		.60												.18	.10							.15		.35	3.25
Trout Run		.05						.56	.03							T												.22		.10	0.96
Turnerville			.25			.97		.38											.09	.02								.23		.11	2.05
Westford			.08			1.03		.27											.20	.02	.05							.19		.35	2.19
Williamsfield						1.17		.22											.45	.08								.18		.15	2.25

*Precipitation included in the next following measurement

Daily Precipitation for October 1917

Station	Day of Month																													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Carlisle					T			.04				.43			.03	T		T	1.10					2.08	.16		1.02			1.28		6.14
Cloe	.04			.94	.13			.20				.57			.42	.17			1.50				.06	1.13	.09		.25	.22		.32		6.04
Coatesville				.06	.02	.05		T	.18		.07	.70			.03	T		T	.68	.63				2.30	.02			.29	T	1.22		6.25
Creekside			.50								.20			.20				1.00				T	.40	.30			.20					2.80
Cresson				.40	.03			.05				.35		.21					1.26			.03		3.21			.22	.10		.15		6.01
Eagles Mere				.58	.37						.09	.64			.18				1.17			1.80	.11	.55		.60	.22			2.20		8.51
Falls Creek	.20			1.20	.20	.20		.80				.60			.20	.10			1.70	.10			T	.90	.80		.10		.10	.70	T.	7.90
Graters Ford				.01		.17			.21		.07	.64								.97				1.00				.52		1.34		4.93
Hadley	.60	.08	.04	.80	.15	.18	.01	.16	.10			.40	.14		.25	.10			.85	.90			.25	.75	1.75		.05			.95		8.51
Harrisburg				.14	T			.04			.01	.57			.03			.01	.81	.30				2.10	.08			.60		1.82		6.57
Karthaus				1.60	.40							.70					.40	1.10	1.70		.80	1.40	.50	.20	.20		.30					9.30
Ketner	.10		.20	.99	.25	.04		.25				.53			.35				1.32				.12	1.40	.35		.24	.27	.30	.57		7.28
Kinsman	.40		.04	.75	.11	.26	T	T				.48	.20		T		T	T	.96	.47			.33	.87	.98		T	.37	.56	.74		7.52
Linesville, 1	.65	.07	.83	.13	.12	.08	.06		.05			.41	.17		.05	.17			.75	.51			.32	.93	.91			.31	.52	.73		7.77
Linesville, 2	.58	.09	.09	.68	.16	.08	.02	T	.02			.06	.46		.18			.09	.91	.67			.28	.78	1.37		.07	.50	.54	.81	.16	8.60
Pennline	.54		.16	.63	.18	.06	.04		.03			.30	.16		.07			.02	1.05	.45	.02		.25	.64	1.25		.03	.54	.52	.90	.10	7.94
Steamburg	.50	.09	.14	.76	.19	.11						.36	.19		.11				1.18	.76			.28	.56	1.51		.06	.60	.53	.95	.15	9.03
Summit	.25	.37	.21	.70	.23	.14			.09			.37	.20					.07	1.50	.63			.30	.93	1.15			.60		1.15	.05	8.94
Transfer	.54	T	.05	.66	.12	.11	.16	.13	.05			.33	.06		.24	.04			.93	.61			.12	.64	1.05			.24	.40	.61		7.09
Trout Run					.15			.07				.05	.67		.05			T	1.25					1.27						.83		4.34
Turnerville	.38		.11	.80	.10	.17	.03		.05			.38	.23		.08				.85	.45			.29	.81	.90		.02	.22	.52	.71		7.10
Westford	.60	.03	.09	.71	.15	.13			.04			.38	.12		.10			.02	.93	.47			.30	1.01	.96		.05	.32	.60	.73	T.	7.74
Williamsfield	.28		.12	.73	.10	.10	.05		.10			.33	.08		.10				1.13	.45			.37	.95	.93			.50	.48	.68		7.48

Daily Precipitation for November 1917

Station	Day of Month																												Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Camp Hill																					.13	.20						.02		.22	0.57
Carlisle																				.20	.26			T.				.01	T.	.21	0.68
Cloe																.04						.16	.05	.01							0.26
Coatesville													T.			T.				T.	.02	.36	.04	T.			T.	.16	T.	.29	0.87
Creekside																									T.		T.				0.00
Cre son	.02															.02					.11			.02	.03	.05	.08				0.33
Eagles Mere																						.71		T.						.31	1.02
Falls Creek	T.	T.													T.		.10			.01		.20	.10	T.	T.					.01	0.42
Graters Ford																					.07		.37					.02			0.46
Hadley		.05														.13						.12	.10			.12					0.52
Harrisburg, E. S.																					.13	.13	.03					.02		.22	0.53
Harrisburg, N. S.																					.14	.13	.04					.02		.21	0.54
Jersey Shore																					.04	.25	.15	T.				.01	.02	.01	0.48
Karthaus																															0.00
Ketner																					.04	.14		.05						.02	0.25
Kinsman		.07														.04					T.	.08	.16		.04	.24	T.			T.	0.63
Linesville, 1		.10														.08					.01	.13	.23	.05	.03	.30	T.			.04	0.97
Linesville, 2	.07	.04														.06					T.	.11	.24	.02	.03	.30	T.			.04	0.91
Pennline	.05	.04														.03					.01	.11	.20	.06	.05	.24		.02			0.81
Steamburg	.10															.05						.18	.26	.09	.05	.27					1.00
Summit	.10																					.20	.33	.12	T.	.30					1.05
Transfer		T.														.10					T.	.12	.06	T.	T.	.30				T.	0.58
Trout Run																						.25	.18					T.			0.43
Turnerville	.01	.05														.06					.01	.09	.18	.04	.03	.30		.02			0.79
Westford	T.	.06																				.10	.22	.05	.05	.12	T.	.04			0.64
Williamfield		.10														.08						.11	.23	.06		.29					0.87

Daily Precipitation for December 1917

Station	Day of Month																													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Camp Hill	.02							.75	.01			.04	T	.60		.06	.03		.05						.02			.02				1.60
Carlisle							.08	.96				.08	.20	.50		.09	.08	T	.09		T			T	.11			T	.05			2.24
Cloe	.10						.85	.85						.27											.09							2.21
Coatesville	.10		T	T		T		.94				.02	.07	.85		T	.25	T							.04				.01			2.28
Creekside					.80			.10					.12				T								.15			.02	.10			1.17
Cresson	.09				.04		.06	.43	.27	.03		.03	.12	.17	.02	.09	.04							.05	.15							1.71
Eagles Mere							.52						1.28	.10	.10									.75				.50				3.25
Falls Creek	.10				T	T	.20	.20	.10	T			T	.20		T					T			.10					T			0.90
Graters Ford	.37								.78					.07			.10								.13							2.05
Hadley	.30							.10	.40					.50									.05		.02			.05				1.42
Harrisburg, E. S.	.02						T	.72				.02	.01	.79		.06	.03		.05						.07				.02			1.79
Harrisburg, N. S.								.89				.04	T	.53		.05	.02		.04						.08				T			1.65
Jersey Shore	.06						T		.79				.03	.59			.14								.13				.02			1.76
Karthaus		.40						.35						.55		.05	.35							.07								1.65
Ketner	.16	.04			.03	.06	.06	.70	.06	.03			.08	.07		.05								.03				.02			1.41
Kinsman	.20					T		.10	.55					.21	.08	.06		.01				.01		.02	.04				.04			1.33
Linesville, 1	.25							.03	.50					.33	.08	.04								.04	.08	T		T	.09			1.33
Linesville, 2	.20				T	T	T	.09	.55		.03			.33	.08	.04						.01		.04	.08	T		T	.09			1.60
Pennline	.23	T			.02	T	.01	.12	.57		.02			.21	.14	.07	.03							.03	T			.07	.02			1.54
Steamburg	.30	.21						.12	.50	.30	.10			.15	.15													.07				1.90
Summit	.27							.09	.40	.06	.04			.50	.02	.04									.06			.05	.03			1.56
Transfer	.30							.20	.60					.20	.01	.04									.01			.10	.01			1.47
Trout Run		.15						.60						.65		.08					.10			T				.05				1.63
Turnerville	.21						.02	.11	.30	.01				.48	.01	.03	.01							.12	.02			.08				1.46
Westford	.22	T		T	T	T	.02	.10	.40					.50	.04	.04	T								.01			.12	.01			1.40
Williamsfie'd	.3							.14	.56		.02			.21	.12	.05	.04							.04				.07	.02			1.50

Monthly and Annual Precipitation for the year 1917

Station	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Camp Hill											0.57	1.60	
Carlisle	4.40	1.78	4.01	1.99	2.50	3.32	5.50	7.07	4.46	6.14	0.68	2.24	44.09
Cloe	3.39	1.12	3.21	2.93	3.26	5.43	5.21	5.40	1.74	6.04	0.26	2.21	40.20
Coatesville	3.84	1.42	4.64	2.17	2.99	5.06	4.24	1.42	3.29	6.25	0.87	2.28	38.47
Creekside	2.90	0.65	1.54	0.75	1.15	1.85	5.92	2.04	1.50	2.80	0.00	1.17	22.27
Cresson	3.66	1.40	3.89	2.96	3.63	5.70	3.16	3.80	3.40	6.01	0.33	1.71	39.65
Eagles Mere	3.30	1.12	2.91	1.73	3.65	5.21	5.55	9.31	1.26	8.51	1.02	3.25	46.82
Falls Creek	3.37	1.35	3.17	1.97	4.00	6.00	4.80	4.00	2.00	7.90	0.42	0.90	39.88
Graters Ford,	3.88	1.74	4.55	1.80	3.37	4.91	6.32	2.47	1.71	4.93	0.46	2.05	38.19
Hadley	2.28	1.02	2.42	2.52	3.96	7.96	3.52	3.00	2.40	8.51	0.52	1.42	39.53
Harrisburg, E'ly. Sec.	4.19	1.44	4.20	2.28	2.50	3.54	3.46	8.58	4.88	6.57	0.53	1.79	43.96
Harrisburg, N'ly. Sec.											0.54	1.65	
Jersey Shore											0.48	1.76	
Karthaus	1.29	0.60	1.78	0.55	2.26	2.18	3.53	4.25	0.80	9.30	0.00	1.65	28.19
Ketner	2.42	1.45	3.01	1.71	5.15	8.84	4.80	4.99	1.59	7.28	0.25	1.41	42.90
Kinsman, Ohio	2.48	0.98	2.39	2.50	4.13	7.38	5.01	2.90	3.20	7.52	0.63	1.33	40.45
Linesville, No. 1	2.20	1.08	2.68	3.08	5 54	6.26	4.48	5.33	1.68	7.77	0.97	1.33	42.40
Linesville, No. 2	2.65	1.32	2.94	2.60	4.94	5.58	3.63	4.85	2.18	8.60	0.91	1.60	41.80
Pennline	2.40	1.16	3.05	3.09	5.03	4.70	3.56	4.76	2.04	7.94	0.81	1.54	40.08
Steamburg	2.87	1.60	2.92	2.34	6.24	5.20	6.35	4.94	1.95	9.03	1.00	1.90	46.34
Summit	2.65	1.02	2.51	2.82	5.81	5.32	4.56	4.27	2 34	8.94	1.05	1.56	42.85
Transfer	2.81	0.57	2.49	2.22	4.20	6.23	5.85	2.29	3.25	7.00	0.58	1.47	39.05
Trout Run								4.24	0.96	4.34	0.43	1.63	
Turnerville	2.43	1.26	2.46	2.96	4.57	5.31	3.63	2.78	2.05	7.10	0.79	1.40	36.74
Westford	2.37	0.94	2.48	2.71	4.62	5.97	4.07	3.74	2.19	7.74	0.64	1.46	38.93
Williamsfield, Ohio	2.22	0.92	2.46	2.58	4.59	5.25	5.33	2.56	2.25	7.48	0.87	1.50	38.01

TABLE NO. XXIX

Daily, Monthly and Annual Precipitation for 1918
Daily Precipitation for January 1918

Station	Day of Month																													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Camp Hill		.02					.29					1.67			.89			.03				.25		.02	.03		.30	.69		.02	.05	4.26
Carlisle		.11				T	.40					1.62			.96			.12				.47		.01	.05	T	.42	.93		.09	.14	5.32
Cloc							.43	.02	T	.20	.70			.71			.03					.14	.07	.21	.21		.30	.20				3.22
Coatesville		.03					.34					2.25			.76			.02				.42			T		.18	.36	.02	.12	.02	4.52
Creekside							.10	.12				.15		.54	.10							.30		.10	.50		.30	.12				2.33
Cresson		.17					.38	.05	T	T		.82			1.02		.07	.06				.10	.04	.33	.18	.16	.34	.90	.16	.08		4.86
Driftwood							.40							.40								.10		.20			.30					1.40
Eagles Mere			.11					.80			*	2.47			1.10			.40				.50	.33	.56	.11	.12		.65				7.15
Falls Creek							.10	.20	.10	.10	.10	.40	.10		.58		.30					.14		.50		.60						3.22
Graters Ford							.67					1.28			.89				.43			.39						.62			.10	4.38
Hadley							.28	.08	.05	.05					.25	.08	.07					.17	.08	.03	.10	.15	.10		.05				1.54
Harrisburg, E. S.		.05					.29					1.61			.88			.06				.32		.02	.03		.33	.64		.03	.07	4.33
Harrisburg, N. S.			.16				.31					1.62			1.00			.04				.25		T			.29	.58			.07	4.32
Jersey Shore							.25					.77			.95			.05				.26		.02	.03		.31	.24				2.83
Karthaus								.10							.90							.20					.35	.65				2.20
Ketner		.03					.41	.06	.03	.06		.56			.47		.07	.03	.03			.04	.05	.09	.11	.07	.15	.09				2.35
Kinsman							.22	.03	.01			.06		.04	.42		.04					.03	.07	.05	.10	.07	.28		.03			1.48
Linesville		.02	T				.18	.15	.16	.08	.02	.07			.34	.08	.06	.05	T			.07	.06	.07	.14	.07	.22					1.84
North Shenango		T					.13	.24	.08	.05	.01	.08			.33	.08	.03	.05				.07	.08	.07	.18	.06	.22					1.76
Penn Line		.01					.27	.16	.05	.02	.01	.17			.30	.08	.04	.05	T			.05	.02	.06	.18	.05	.22	.05	.02			1.81
Steamburg		.01					.30	.13	.08	.02	.01	.07			.34	.11	.06	.05				.10	.06	.07	.18	.24	.16	T				1.99
Summit					T		.34	.13	.08	.02		.07			.30	.12	.03	.05				.10	.06	.07	.18	.16	.22	T				1.93
Transfer		T			T		.28		T	T	T				.30		.08	.04				.06	.02	.03	.07	.02	.14					1.04
Trout Run							.04								1.58			.10				.15	.03	.10	.02			.20				2.22
Turnerville		.02			.01		.27	.15	.05	.02	.01	.13			.40	.07						.09	.07	.05	.15	.06	.17	.08	.03			1.83
Westford		T			.01		.29	.05	.05	.05		.15			.36	.08	.05	.05				.06	.05	.05	.18	.06	.20		.03			1.77
Williamsfield					.11		.29	.08	.04			.23			.33		.03					.07	.09	.05	.18		.23		.07			1.80

*Precipitation included in the next following measurement

Daily Precipitation for February 1918

Station	Day of Month																											Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Camp Hill	T		T	.02		.02	.01		.06						.02				.65	.23		.12			.44	.67			2.24
Carlisle			T	T		.01			.03			T			T				.75	.18		.18			T	1.80			2.35
Cloe			.12	T		.11	T		.43				.05		.25				.99	.70		T				.78		.03	3.46
Coatesville			T			T			.16										.55	.23		.08				.85			1.87
Creeksi'e							.15			.32									.70							.15			1.32
Cresson				.08			.20		.38				.03		.21		.01		.90	.30	.03	.10			1.03	.05			3.32
Driftwood									.20										1.30						.40			.10	2.00
Eagles Mere								1.66													1.64	.11			.95			.13	4.49
Falls Creek									.90			.10			.10				.90										2.00
Graters Ford			T				.01			.20										.85			.11			.58			1.75
Hadley			.05				.10		.15				.15		.45				.02	1.30		.03				.12			2.37
Harrisburg, E. S.	T		T	.02		.02	.01		.06						.02				.81	.18		.10		T		1.11			2.33
Harrisburg, N. S.									.14											1.03		.12				1.13			2.42
Jersey Shore			.05						.40						.10		.05		.75	.50		.05				.55			2.45
Karthaus																			1.50	.40						1.20			3.10
Ketner			.03	.03		.09	.03		.38			.04	.10		.18				1.24	.52		.04			.03	.32			3.03
Kinsman		.04		T					.36			.03	.29		.21				.04	.68		.05				.24			1.94
Linesville			.07				.07		.16	.12		.03	.17		.07	T	.02		.05	.57		.11				.35			1.79
North Shenango				.03	.03		.04		.33			.14	.21		.25					.63		T				.25			1.91
Penn Line			T	.04	.02		.07		.18	.05		.10	.13		.27	.02	.02		.05	.53	.02	.03	.01			.43	T		1.97
Summit			T		.02		.09			T			.10		.56		.02			.60	T	T				.35			1.74
Transfer				T			.30		.31	T					.40					.72		.05				.20			1.98
Trout Run			.05			.02			.05			T			.10	T				1.35		.05				1.00			2.62
Turnerville			.05			.12	.06		.40	.02		.04	.17		.20					.74		.01				.27			2.08
Westford			T	T		T			.23			.09	.20		.27	T	T			.62		.02				.23			1.66
Williamsfe'd							.12		.26			.10	.14		.16					.62						.24			1.64

Daily Precipitation for March 1918

Station	Day of Month																													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Camp Hill					.13		.31		.46					.79											.17						1.86
Carlisle				T	.25		.18		.46	T			T	.68										T	.18	T					1.75
Cloe	.30				.21	.11			.53	.30				1.16																	2.61
Coatesville				.11	.11		.11		.22	.03		.10	T	.76	.02							.12			.19						1.77
Creek ide	.12								.20					.40																	0.72
Cresson	.10				.13		.13		.50	.45	.03		.03	.72																	2.09
Driftwood	1.25			.25						1.50			.60	.70												.02					4.30
Eagles Mere									.81	.22				1.62												T					2.67
Falls Creek	.09			.24						.80				1.40																	2.53
Graters Ford	T				.15		.26			.27		T		.68	.03							.18			.12						1.69
Greenville	.95				.17		.09		T	.45	T			1.68	.20																3.54
Hadley	.90				.20		.05			.65				1.50	.15																3.45
Harrisburg, E. S.	T			.02	.14		.20		.48	.02		T	T	.75										T	.20	T					1.81
Harri burg, N. S.					.14		.17		.43					.79											.25						1.78
Jersey Shore							.12			.67				2.23												.01					3.03
Karthaus														1.40																	1.40
Ketner	1.12			.02	.20	.03	.12		.48	.48				1.70																	4.15
Kinsman	.73				.27		.03			1.06				1.60	.11											T					3.83
Linesville	.73				.29		.07			.67	T			1.81	.17											T					3.74
North Shenango	.76				.36					1.00				1.80	.08																4.00
Penn Line	.57				.29	T	.03			.95	.02			2.05	.04											.02					3.97
Summit	.55				.20					.91	T			1.85												T					3.51
Transfer	.98				.25		T			.54	T			1.42	.34											.04					3.53
Trout Run	.26			.04		.03	.07			.50				1.80																	2.74
Turnerville	.75				.28		.06			1.00				1.83												T					3.92
Westford	.85				.25		.04	T		.97				1.70	T																3.81
Williamsfield	.62				.27		.06			.92				1.70																	3.57

Daily Precipitation for April 1918

Station	Day of Month																													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Camp Hill	----	----	.25	.03	----	----	----	.29	1.03	1.28	.40	.60	.02	----	----	----	----	----	----	.23	.62	.49	.02	.03	----	----	----	----	----	.28	5.57
Carlisle	----	----	.37	----	----	----	----	.47	1.41	1.26	.90	.97	.06	----	----	----	.02	----	----	.29	.98	.23	.09	.03	----	T	----	----	.48	.27	7.83
Cloe	----	----	.18	.25	----	----	.05	.48	----	.37	----	1.17	----	----	----	----	.32	.16	----	----	----	.08	.13	----	----	----	.06	----	.06	.17	3.48
Coatesville	----	----	.10	.02	----	----	----	T	1.11	1.00	.47	.22	.04	----	----	----	.02	----	----	T	1.18	T	----	----	.05	----	----	----	----	4.21
Creekside	----	----	----	----	----	----	----	.50	----	.50	----	.50	----	----	----	----	.30	----	----	----	----	----	----	----	----	----	----	----	.12	----	1.92
Cresson	----	----	.13	.05	----	----	----	.63	.60	1.83	.38	1.13	----	----	----	.06	.25	.05	----	.15	.32	.22	.03	----	----	.03	.03	----	.03	.15	6.07
Driftwood	----	----	----	----	----	----	----	.11	1.24	.82	.73	.27	----	----	----	----	.17	.15	----	.15	----	----	----	----	----	----	----	----	----	----	3.64
Eagles Mere	----	----	.39	----	----	----	----	1.39	1.20	.90	.11	----	----	----	----	.47	.38	----	----	----	.25	.60	.19	----	----	----	----	----	.57	----	6.45
Falls Creek	----	----	.40	----	----	----	----	.40	----	.20	----	1.20	----	----	----	----	.57	----	----	.80	----	----	.27	----	----	----	----	----	----	----	3.84
Graters Ford	----	----	----	.24	----	----	----	----	----	.42	----	----	1.11	----	----	----	T.	----	----	T	----	1 27	----	----	----	----	----	----	----	----	3.34
Greenville	----	.01	.12	.08	----	----	----	.68	.03	.03	.50	.29	.01	----	----	----	.32	.11	.04	----	.09	.04	.02	.27	----	----	.04	----	.65	----	3.33
Hadley	----	.05	.10	----	----	----	----	.75	----	.10	.25	.12	----	----	----	----	.20	----	----	.15	.20	----	.20	.35	----	----	.18	----	.48	----	3.13
Harrisburg, E. S.	----	----	.27	.01	----	----	----	.26	.96	1.25	.51	.71	.02	----	----	T	.03	T	----	.14	.86	.48	.01	.04	----	----	----	----	----	.42	5.97
Harrisburg, N. S.	----	----	----	.26	----	----	----	----	.82	1.39	.36	.73	.13	----	----	----	----	.02	----	----	.95	.29	----	.03	----	----	----	----	----	.41	5.39
Jersey Shore	----	----	.03	----	----	----	----	.52	.92	1.45	1.00	.22	----	----	----	----	.16	.14	----	----	.38	.03	.15	----	----	----	----	----	----	.35	5.35
Karthaus	----	----	----	----	----	----	----	.35	.45	.12	.16	----	----	----	----	----	----	----	----	----	.10	----	----	----	----	----	----	----	----	.20	1.38
Ketner	----	----	.45	----	----	----	.04	.44	----	.10	.18	.19	----	----	----	.05	.35	.15	.09	----	.09	.11	.17	----	----	----	.08	----	.10	----	2.59
Kinsman	----	T	.04	.06	----	----	----	.48	----	----	.28	.12	T	----	----	----	.55	.10	.04	----	.15	T	T	.09	----	----	.02	----	.25	----	2.18
Linesville	----	T	.36	.03	----	----	----	.61	----	.04	.41	.07	----	----	----	----	.24	.15	.03	.06	.04	.12	.08	.24	----	----	.07	----	.24	.02	2.81
North Sbenango	----	----	.12	.06	----	----	----	.63	.06	----	.34	.16	----	----	----	----	.22	.16	.08	.24	----	.14	.16	.28	----	----	.05	----	.17	----	2.87
Penn Line	----	T	.30	.03	----	----	----	.51	----	----	.45	.08	.03	----	----	----	.28	.25	.02	----	.15	.08	.13	.14	----	----	.03	----	.22	----	2.70
Summit	----	----	.75	.20	----	----	----	.40	----	----	.45	.08	T	----	----	----	.25	.15	----	----	.13	----	.42	.24	----	----	.09	----	.26	----	3.42
Transfer	----	----	.09	.08	----	----	----	.61	----	T	.33	.09	----	----	----	----	.83	.11	----	----	.15	T	T	.28	----	----	----	----	.65	----	3.22
Trout Run	----	.05	----	----	----	----	----	----	----	----	1.75	.33	----	----	----	.15	.25	----	----	.03	.30	----	.35	----	----	----	----	----	.38	.25	3.84
Turnerville	----	----	.05	.12	----	----	----	.59	----	----	.46	.16	----	----	----	----	.26	.11	.07	----	.17	.13	.07	.28	----	----	.02	----	.29	----	2.78
Westford	----	----	.15	----	----	----	----	.70	----	----	.60	.25	----	----	----	----	.24	.15	.10	----	.17	.10	.12	.27	----	----	.10	----	.25	T.	3.20
Williamsfield	----	----	.18	.05	----	----	----	.50	----	----	.46	.05	----	----	----	----	.24	.13	.03	----	.12	----	.16	.13	----	----	.05	----	.28	----	2 38

Daily Precipitation for May 1918

Station	Day of Month																													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Camp Hill	.32			T	.05	.07		.12		.60			.88	.12								.32			.43		.14	.19	.49			3.73
Carlisle	T			T	.16		T	.16		.34			.22	.16						T	.50	.27	.11		.16	.18	.24	.02	.04	.14	.16	2.86
Cloe	.31			.04	.05		.13			.08		.37	.74								.14		.67		.20	1.97		.08	.19	.66	.27	5.90
Coatesville	.59				.02					.57			.19	.27							.16	.32	.29		.21			.70	.11	.41	.40	4.24
Creekside													.30									.40			.20				.30			1.20
Cresson	.04			.04			.10			.04		.03	.57	.05				.04	.18	1.63	.39		.53		.44	.10		.11	.89	.40	.46	5.37
Driftwood				.40									1.94												.90	.04					.72	4.00
Eagles Mere	.26				.17					.12				.75						.43		.54			.39		.08	.03		.29	.06	3.12
Falls Creek					.07		.12			.16		.25	.78								.18		.09		.50	.25		.36	.90	.40		4.06
Graters Ford		.58		.07		.09				.49		.03		.66							.74	.02	.35					1.74			.24	5.01
Greenville	.01	T	.01		T		.06	.05		.12	.27	.42	.91	.05						.08	.94		1.04		.10	.49	1.12	.20		.05	.48	6.40
Hadley			.12				.10	.10		.40	.42	.41	1.00	.15						.33			.60		.25	.45		.32		.30	.50	5.45
Harrisburg, E. S.	.31			T	.09			.11	T	.42		.02	.78	.12							.14	.15	.09		.44		T	.65		.08	.08	3.48
Harrisburg, N. S.	.26	T			.08	T		.10		.19		.01	.80	.11							.15	.31	.04		.27			.74		.07	.09	3.22
Jersey Shore	.45				.05								1.65							.45	1.82	1.75	.94								.60	7.71
Karthaus					.15							.10	.15							.20			.59		.10	1.20			2.00		.50	4.90
Ketner	.01				.32		.07	.20		.31		.35	.42	.05						.17	.07		1.05		.04	.14		.05		.14	.55	4.02
Kinsman	T				T		T			.20	.54	.52	1.04	T									1.58		.06	1.62		.04	.11		.17	5.88
Linesville	.03	T	T	T		.03	.16	.04		.28	.17	.40	1.03	.02						.03			.52		.05	.22		1.11		.01	.01	4.11
North Shenango	.05					.07	.12	.08		.22	.23	.33	1.10										.32		.04			.64				3.20
Penn Line	.05	.01				.04	.15	.10		.26	.13	.25	1.41	.02						.20			.95		.09	.20		.40		.01	.02	4.29
Shanksville	.31						.18	.24		.10	.29		.41	.04						.43	.32	.16	.28		.68	.10			.15	.26	.09	4.06
Summit	.06	T				.15	.28					.45	1.45							.27			.50			.50		.35			T	4.01
Transfer							.07			.06	.26	.52	1.00							.22	T		.52		.15	1.47		.19		.54	.65	5.65
Trout Run	.03		T		.20						.05	.25	1.75						.38		3.00			.70					.42	.46		7.24
Turnerville	.04						.16			.42	.38	.33	1.00	.03						.01			1.65		.06	.82		.18	.02		.13	5.29
Westford	.07		T		T	T	.13	.02		.35	.38	.72	1.07	.03						.26			.57		.05	.36		.35		T	.08	4.44
Williamsfield							.17	.08		.27	.13	.43	1.16							.23			.61			.70		.05			.10	3.93

Daily Precipitation for June 1918

Station	Day of Month																												Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Camp Hill						.14	.33			.44											.07	1.17									2.15
Carlisle				.01	.32		.18				.41	.32		.05							.06	.90			T	T	T		.05	.06	2.36
Cloe		.06		.18	.09	.26	1.18			.25		.37		.19			.28				.18	1.10									4.14
Coatesville						.14	.61				.28	.37		.19	.22			.07			.02	.66									2.49
Creekside						.40	.30					.30																			1.00
Cresson						.13	.70				.36	.54	.13								.22	1.03						.44		.03	4.76
Driftwood						.11				.08		.08				.07					1.60	4.34									6.28
Eagles Mere							2.30			.12		.87		.29							1.67	.05	.09								5.32
Falls Creek					.58	.24	.50			.64	.10			.17			1.10				1.25							.22		.09	4.89
Graters Ford						.30	1.09				.48	.01		.02	.05			.04				.63				.02					2.64
Greenville			T		.94		.43			.01		.26	.02	.03	.01		T					.78	.04								2.52
Hadley					.85		.80					.34		.10		.38						.60									3.07
Harrisburg, E. S.					.11	.03	.04				.47	.30		.0				.02			.14	1.23			T		.02			.45	2.84
Harrisburg, N. S.						.21	.07				.47	.18		.03								1.52					.01			.25	2.74
Jersey Shore												1.55																		1.80*	3.35
Karthaus		.40		.60		.20	.20		.08													.15									1.63
Ketner		.07		.09	.10	.54	.25			.21		.70		.15			.36				.60	2.08	.09			.03	.12				5.39
Kinsman					.61		.43			T		.11	T	.04								.62						T			1.81
Linesville		.09		.02	.16	T	.65			.01	.03	1.31	.04	.19								.92	.07					.07			3.53
North Shenango					.53		.57				.03	.82	.06	.08								.73							.03		2.85
Penn Line		.23		.02	.25		1.82			.05	.04	1.19	.02	.14								.72	.10					.22	.02		4.83
Shanksville						.33	.26			.28	.05	.42		.15			.15				.10	.98	.02	.03	.01	.01		.84	.20	T	3.83
Summit		.24		.15	.03		2.05			.08		1.08		.20								.82	.10					.20			4.96
Transfer					.24		.77				.78			T	.19							.73									2.71
Trout Run	.05			.03	.15		.72			.03		.50		.07							.50				.09				.07		2.21
Turnerville					1.07		.54				.06	.04	.01	.04	.01							1.11	.05								2.93
Westford					.53		.85					.10		T								.89	.03								2.31
William field					.40		.68					.13		.08								.52									1.81

*Total, 13th to 30th inclusive

Daily Precipitation for July 1918

Station	Day of Month																															Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Camp Hill	.71					.01						.01	.23	.01			.01								1.01						.90	2.89
Carlisle	.51		.22		.01				T	T	T	T	.16	T			.12		.07				.22	.83	.10			.02		.28		2.54
Cloe	.26												.61										.45	.21	.71				.24	1.22		3.70
Coatesville	.02									T	.27	.08	.20	.02				.14					T	.02						.73	.05	1.53
Creekside																								.40						.40		0.80
Cresson	.02									.01		.31	.04	.05			.25						.87	.11					.20	.57		2.43
Driftwood																														1.24		1.24
Eagles Mere	1.67										.43		.13	.02			.15							1.66						.31		4.37
Falls Creek													.68										1.00	.22					1.23			3.13
Graters Ford		.58		.12						T	1.01		.71		.65		.15	.03	.07											.12	.84	4.28
Greenville	.15									T	.06												.12	1.13		.15				1.49		3.10
Hadley	.25										.10												.20	1.30		.15				1.40		3.40
Harrisburg, E. S.	.25			.01	T				T	T	.02		.50	.12	T								T	2.50	.38					.57	.03	4.38
Harrisburg, N. S.	.55			T							.02		.25		.07		T							.09	1.27				T	1.39		3.64
Jersey Shore													.67	.32											1.25					.87		3.11
Karthaus																							.10						.12	.10		0.32
Ketner	.21								.04	.14			.30	.43										.37	.10					.47		2.06
Kinsman	.48									T								T						T	.36	.09		T	T	.34		1.27
Linesville	.17									T	.02						T	.02					.10	.04	.41	.03		.24		.91		1.94
North Shenango	.05									.04														.12	.17	.13		1.40		.23		2.14
Penn Line	.91									.02	.01												.08	T	.33			.95		1.65		3.95
Shanksville					.26							.04	.27	.01				.11	.41					.82					1.02	.86		3.80
Summit	.35										.04														.20	.22				1.70		2.51
Transfer	.17									T	.04												.05	1.02		.14			.07	1.51		3.00
Trout Run	.28				.30				.32				.18	.22		.08					*	*	*	*	*	*	1.05			.45		2.88
Turnerville	.28									.02																.24				.19		0.73
Westford	.08									.06							T							.13		T				.27		0.54
Williamsfield	.27																								.44	.12		.92		.35		2.10

*Precipitation included in the next following measurement

Daily Precipitation for August 1918

Station	Day of Month																														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Camp Hill					.77				T		.29	.28		T	.77							T				.02		.03	.35		.25	2.76
Carlisle					1.10			.06	1.27	1.08	.06	.11		.12			T	T								.03		.04	.29	T	.34	4.50
Cloe					1.32			1.75	1.29	.08		.19		.81			.08												.93		1.08	7.53
Coatesville				T	.15					T	.04	.02										T			T	.05			.18			0.44
Creekside								.30	.10																.30						.40	1.10
Cresson			.03		1.47		.10	.39	.15	.15	.04	.03	.14	.44	.03		.04					.21				.07		.05	.45	.10	1.38	5.27
Driftwood					1.48								1.27																		.76	3.51
Eagles Mere					1.16				.55			.62	.53	.15									.15						1.80		.68	5.64
Falls Creek				.83			.55	.30	.12		.15		.40	.15								.07						1.30		.30		4.17
Graters Ford					.06						.01	.20		.35											.75					.84		2.21
Greenville				.06	.05			1.00	.92	.03	.06	.85											.06				.07		.42		.07	3.59
Hadley								.35	.50		.08					.20							.45				.10		1.00		.05	2.73
Harrisburg, E. S.					.49		T		*	*	*	.81	.10	.61	.04		.01	.02				T			.04	.02			.59		.21	2.94
Harrisburg, N. S.					.29			T	.02		.26	.88		.15	.49		T					.03				.06	.01	.55	.01		.20	2.95
Jersey Shore				1.10					.35	.15	.05			.60															1.35		.30	3.90
Karthaus					.70					.60																					.20	1.50
Ketner				.16	.69			1.35	.98	.42	.59		.73	.19												.05			.60		.90	6.66
Kinsman				.10				.63	1.19		.93	.08														.03	T		.63			3.59
Linesville				T	T			.63	.45		T	.05					.14					.19				.04	.02		1.17		.07	2.76
North Shenango								.42	.25			.05					.07					.05					.04		.63			1.51
Penn Line				.06				.51	.82	.02		.07					.12					.02				T			.67		.04	2.33
Shanksville					.02			1.07	.22	.08	.10	.25	.14	.09				T				.53							.10	.40	1.63	4.63
Summit								.37	.42			.40										.43				T			1.43		.02	3.07
Transfer					T			.82	.42		.11	.80					T						.05				.10	.35		.12	2.77
Trout Run				1.03					1.01	1.10	.25		.18																1.19		.84	5.60
Turnerville				.08	.05			.39	.40			.42					.05					.02					.09		.38		.06	1.94
Westford								.23	.19																	T			.82		.05	1.29
Williamsfield								.48	.35			.20																	.55			1.58

*Precipitation included in the next following measurement

Daily Precipitation for September 1918

Station	Day of Month																													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Camp Hill						.32						.17	.07				.13	1.20		1.00	.24										3.13
Carlisle					T	.25		.13				.03	.37			.02	.42	.61		1.36						.04					3.23
Cloe			.09		.19							.97	.64			.19	.02			.42						.10				.05	3.57
Coatesville	.75					.33		.29				.21						1.40		.46	.40					T					3.84
Creekside												.70					.30		.20						.10					1.30
Cresson			.08		.60	.04						.66	.40				.54	.09		.55		.07				.06					3.09
Eagles Mere			.05			1.11						.33	1.44				.70	.45		1.02	.30				.24	.63				.23	6.50
Falls Creek	.65		.05		.65							.90	.88			.23	.80	.09	.28		.12				.22		.04				4.91
Graters Ford	1.05						.01		.16			T	.10			T		1.08			1.11						.10				3.61
Greenville	.53		.82		.49	.62						.21	.50			.52	.78		.22	.37	.17	.27				.03	.04				5.57
Hadley	.20		.60		.70	.30						.25	.30			.30	1.00		.40	.30	.10	.32			.05	.05					4.87
Harrisburg, E. S.					T	.37		.13				.11	.13			T	.07	1.26		1.00	.25					.05					3.27
Harrisburg, N. S.						.20		.13				.13	.15			T	.07	.74	.39	.87	.35					.02					3.05
Jersey Shore						2.00						.20	.55				.60	.50		.49					12	.42					4.88
Karthaus					.12							1.20	.30				.12			.60				.10			.20				2.64
Ketner			.28		.86							.93	.58			.40	.53			.67	.18	.06			.38	.20				.10	5.17
Kinsman		.04	.43		1.03	.34					T	.32	.52	T		.40	.70		T	.42	.11	.33				.12					4.76
Linesville	.09		.41	.03	1.03	.25					.03	.08	.86	.16		.41	.75		.04	.48	.22	.47			.21	.12	.30				5.94
North Shenango			.42		.82	.38	.07					.35	.75	.08		.35	.84			.58	.35	.22				.24	.22				5.67
Penn Line	.06		.42		.62	.26						.20	.62	.16		.35	.73		.04	.48	.29	.39			.21	.07	.23				5.13
Shanksville			.14		.02	1.00						.43	.30				.42	.27		.30						.10					2.98
Summit	.08		.57		.95	.35						.35	.30	.47		.50	.54		.30	1.35	.60					.25	.20				6.81
Transfer	.10	.12	.36		.85	.42						.26	.55			.56	.79		.24	.10	T	.20				T	T				4.55
Trout Run			.08		1.00			T				.30	.78				.60	.65		.51	.39				.35	.30				.17	5.13
Turnerville			.52		1.25	.08						.48	.37	.02		.41	.66		.01	.40	.21	.32			.05	.15	07				5.00
Westford			.37		1.06	.20						.25	.66			.52	.56			.45	.32	.35		T	.07	.18	.12				5.11
Williamsfield			.38		.98	.10			.16			.53	.37			.35	.82			.44		.33				.15	.10				4.71

Daily Precipitation for October 1918

Station	Day of Month																													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Camp Hill	.18					.48					.09										.55					.26				.29	1.10	2.95
Carlisle	.11					.47						.04	T							.42					.44				.02	1.38	.04	2.96
Cloe		.15	.16			1.20						.18								.41					.50	.23		.28		.60	.14	3.85
Coatesville	.08					.28	.06				T									.34	.12									T	.58	1.46
Creekside												.70							.30	.20					.70	.30			.30	.60		3.10
Cresson	.05		.07			1.08	.06					.08								.46	.10				.24	.17		.05	.02	.57	.08	3.03
Eagles Mere			.24		1.10	.09						.02								.85						.29			.04	1.53		4.16
Falls Creek		.80			1.15							.20								.57					.54	.28		.42	.10	.25	.32	4.63
Graters Ford		.24					.65						.02								.27										.45	1.62
Greenville		.02	.45			.83						.49								.55	.04				.09	.14		.48	.03	.09	.35	4.16
Hadley		.05	.60			.65						.42	.12							.20	.40					.65			.35	.25	.50	4.19
Harrisburg, E. S.	.12					.46						.03	.07							.60	.02				.18	.07			.02	.13	.97	2.61
Harrisburg, N. S.	.10					.45	.08						.04							.53	.60					.29	.04			.30	1.11	3.01
Jersey Shore	.13		.43			.80						.17								.20	.05					.27				1.20		3.58
Karthaus	.20	.12				.30														.58	.15						.40	.50			.80	2.67
Ketner			.79			1.20						.22		.04						.54	.13				.46	.09		.53		.64	.23	4.85
Kinsman	T	.12	.50			.53	T					.48		T						.50	.27					.26			.48	.11	.31	3.70
Linesville	T	.12	.40			.75	.11					.42	.03		.01					.51	.23					.33			.50	.05	.28	3.73
North Shenango	.08	.06	.63			.52	.12					.37	.08							.49	.23					.32			.63	.22	.18	3.95
Penn Line	.06	.05	.31			.64	.09					.60	.06	.02	T					.47	.45					.18			.37	.03	.28	3.63
Shanksville		.07	.06	.81								.07								.25	.07				.21	.19			.29		.10	2.34
Summit	.36		.50			.50	.24					.65								T	1.05					.44			.48			4.41
Transfer			.43		T	.77						.40	.10							.49	.55					.70	.29		.50	.29	.36	4.39
Trout Run			.74			.04						.08		.05						.54					.27	.24		.15		.17	.75	2.95
Turnerville	.0	.03	.45			.80	.02					.36	01	.03						.5	.27					.44			.56	.15	.30	4.07
Westford	T	.16	.45			.58	.13					.37	T	T	T					.6	.13				.02	.32		T	.48	.03	.32	3.69
Williamsfield	.10	.06	.54			.43	.07					.45														.42			.48		.34	3.64

Daily Precipitation for November 1918

Station	Day of Month																														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Camp Hill																	.11	1.01	.37	.11									.41			2.01
Carlisle	T								T								.10	.82	T	.08	.01	T	T					.34				1.35
Cloe				.07					.05	.06							.62	.49	.22	.11								.12				1.74
Coatesville				.02													.75	.96	.06	.05								.33	.15			2.32
Creekside																				.48	.40											0.88
Cresson	.04			.07						.06							.23	1.03	.18	.23	.03								.10			1.97
Eagles Mere		.10		.24		.25					.32						1.94	.18	.12									.30		.03		3.48
Falls Creek				.20					.15								.35	.90	.23	.13								.01				1.97
Graters Ford					T													1.32	.01		T								.42			1.75
Greenville	.04	.10		.11	.06					.19							.13	.49	.29	.25	.07	.03	.02	T					.05			1.83
Hadley	.02	.05		.14	.05					.45							.20	.45	.40	.25	.08		.08						.10			2.27
Harrisburg, E. S.				T					T								.16	.93		.08								.35	.04			1.56
Harrisburg, N. S.					T												.14	.97		.20									.40			1.71
Jersey Shore				.20													.32	.91	.04	.12									.10			1.69
Karthaus	.20																.25	.60	.20													1.25
Ketner		.12		.23					.09	.15							.29	.85	.15	.18	.04							.06				2.16
Kinsman	.08			.20					T	.21							T	1.45	.20	.16	.08								.04			2.42
Linesville	.04	.16		.32	.13					.13	T						.02	1.25	.28	.17	.16	.07	.03						.08			2.84
North Shenango		.24		.22	.18					.25								1.30	.34	.24	.18	.06							.06			3.07
Penn Line	.07	.21		.27	.04					.10								.64	.18	.15	.14	.07	.09						.09	T		2.05
Shanksville																	.46	.49	.17	.29		.02						.30				1.73
Summit	.36	.40		.15	.25					.17								.71	.28	.20	.09	.09							.09			2.79
Transfer	.02	.05	T	.23	.02				.06	.10							.55	.13	.29	.21		.08							.06			1.80
Trout Run			.16	.12													.25	.65	.20	.16	.14							.07				1.85
Turnerville	.02	.04		.28	.15					.12								1.05	.20	.16		.11							.08			2.22
Westford	.02	.07		.22	.06				T	.18								1.41	.26	.15	.09	.03	.08	T					.02			2.59
Williamsfield		.10		.25	.08					.12								.54	.20	.17			.18						.02			1.66

Daily Precipitation for December 1918

Station	Day of Month																													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Camp Hill													.8(	.50	.38							1.35			.41							3.51
Carlisle			.0[illegible]	T		T					.88	.08	.38	.19	.28							1.40		.47		T	T				.40	4.02
Cloe			.03	.13							.56		.34	.26	.08							.79		.15	.11				[illegible]		.08	2.65
Coatesville											1.18	.06	.08	.07	1.26	T						1.72	.05	.55	.00	T				T	5.06
Creekside											.74			.38								.50		.10	T	T			.34		.40	2.46
Cresson				.39	.12						.87		.45	.10	.14							.78		.10	.06	.12	.06		.11	.02	.04	3.36
Eagles Mere			.16										*	.42										2.00		.18					2.76
Falls Creek			.05	.01							.45		.32	.20								.85		.20	.05				.05			2.18
Graters Ford												1.17			.9[illegible]								1.31		.58							4.02
Greenville			.03	.33	.03						.20		.46	.21	.2[illegible]							.61		.13	.40						.05	2.67
Hadley				.25		.05					.20		.24	.20	.7[illegible]							.30	.35		.40		.05		.03		.04	2.86
Harrisburg, E. S.				T							.93	.02	.34	.05	.4[illegible]							1.40	.02	.31	.05	.01					.07	3.70
Harrisburg, N. S.												.88		.35	.40							1.50	.05		.42	.01					.07	3.68
Jersey Shore				.13		.08				.65	.04	.29										.80		.12	.12							2.23
Karthaus									.20	.20	.20	.28	.10									.20	.40	.80	.40					.40		3.18
Ketner	.03		.20	.18	.17						.40		.2	.28								.59		.19	.08	.07			.04			2.50
Kinsman				.21	.00						.13		.22	.04	.5[illegible]							.56		T	.46						.05	2.33
Linesville	.11		.04	.30	.17						.24	.02	.21	.16	.4							.50	.02	.06	.40	.03	.05	.03	.07	.01	.04	2.93
North Shenango	T			.24	.08					*	.15	.04	.2[illegible]	.15	.4[illegible]							.48		.08	.42				.04			2.34
Penn Line	.03		.01	.28	.05		.02				.19		.2	.18	.4							.45	.02		.41	.03		T	.07		.04	2.42
Shanksville				.31	.02	.22				.56	.78		.45	.14	.0[illegible]	.06						.82		.25	.20	.10		.05	.06			4.09
Summit	.04			.36	.05						.29	.26	.1[illegible]	T	.4							.50	.15	.30	T				.10	T	.04	2.68
Transfer	T		T	.13	.09	T					.12		.30	.27	.4							.55	.05		.42	T	T	T	.05	T	.07	2.49
Trout Run				.21		.08					.42		.18		.1							1.10			.23		T				.09	2.43
Turnerville	.01			.22	.02						.12	.03	.2[illegible]	.09	.4[illegible]							.52			.48		.01		.01		.04	2.19
Westford	T		T	.26	.05						.14	T	.20	.12	.4							.46		.05	.40	T		T	.05		T	2.20
Williamsfield				.20	.04						.18		.20	.13	.2[illegible]							.52			.36				.07			2.08

*Precipitation included in the next following measurement.

Monthly and annual Precipitation for the Year 1918

Station	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Camp Hill	4.26	2.24	1.86	5.57	3.73	2.15	2.89	2.76	3.13	2.95	2.01	3.51	37.06
Carlisle	5.32	2.35	1.75	7.83	2.86	2.36	2.54	4.50	3.23	2.96	1.35	4.02	41.07
Cloe	3.22	3.46	2.61	3.48	5.90	4.14	5.70	7.53	3.57	3.85	1.74	2.65	45.85
Coatesville	4.52	1.87	1.77	4.21	4.24	2.49	1.53	0.44	3.84	1.46	2.32	5.06	33.75
Creekside	2.33	1.32	0.72	1.92	1.20	1.00	0.80	1.10	1.30	3.10	0.88	2.46	18.13
Cresson	4.86	3.32	2.09	6.07	5.37	4.76	2.43	5.27	3.09	3.03	1.97	3.36	45.62
Drittwood	1.40	2.00	4.30	3.64	4.00	6.28	1.24	3.51	------	------	------	------	------
Eagles Mere	7.15	4.49	2.67	6.45	3.12	5.32	4.37	5.64	6.50	4.16	3.48	2.76	56.11
Falls Creek	3.22	2.00	2.53	3.84	4.06	4.89	3.13	4.17	4.91	4.63	1.97	2.18	41.53
Graters Ford	4.38	1.75	1.69	3.34	5.01	2.64	4.28	2.21	3.61	1.62	1.75	4.02	36.30
Greenville	------	------	3.54	3.33	6.40	2.52	3.10	3.59	5.57	4.16	1.83	2.67	------
Hadley	1.54	2.37	3.45	3.13	5.45	3.07	3.40	2.73	4.87	4.19	2.27	2.86	39.33
Harrisburg, E. S.	4.33	2.33	1.81	5.97	3.48	2.84	4.38	2.94	3.27	2.61	1.56	3.70	39.22
Harrisburg, N. S.	4.32	2.42	1.78	5.39	3.22	2.74	3.64	2.95	3.05	3.01	1.71	3.68	37.91
Jersey Shore	2.88	2.45	3.03	5.35	7.71	3.35	3.11	3.90	4.88	3.58	1.09	2.23	44.16
Karthaus	2.20	3.10	1.40	1.38	4.90	1.63	0.32	1.50	2.64	2.67	1.25	3.18	26.17
Ketner	2.35	3.03	4.15	2.59	4.02	5.39	2.06	6.66	5.17	4.85	2.16	2.50	44.93
Kinsman	1.48	1.94	3.83	2.18	5.88	1.81	1.27	3.59	4.76	3.70	2.42	2.33	35.19
Linesville	1.84	1.79	3.74	2.81	4.11	3.53	1.94	2.76	5.94	3.73	2.84	2.93	37.96
North Shenango	1.76	1.91	4.00	2.87	3.20	2.85	2.14	1.51	5.67	3.95	3.07	2.34	35.27
Penn Line	1.81	1.97	3.97	2.70	4.29	4.83	3.95	2.33	5.13	3.63	2.05	2.42	39.08
Shanksville	------	------	------	------	4.06	3.83	3.80	4.63	2.98	2.34	1.73	4.09	------
Steamburg	1.99	------	------	------	------	------	------	------	------	------	------	------	------
Summit	1.92	1.74	3.51	3.42	4.01	4.96	2.51	3.07	6.81	4.41	2.79	2.68	41.84
Transfer	1.04	1.98	3.53	3.22	5.65	2.71	3.00	2.77	4.55	4.39	1.80	2.49	37.13
Trout Run	2.22	2.62	2.74	3.84	7.24	2.21	2.88	5.60	5.13	2.95	1.85	2.43	41.71
Turnerville	1.83	2.08	3.92	2.78	5.29	2.93	0.73	1.94	5.00	4.07	2.22	2.19	34.98
Westford	1.77	1.66	3.81	3.20	4.44	2.31	0.54	1.29	5.11	3.69	2.59	2.20	32.61
Williamsfield	1.80	1.64	3.57	2.38	3.93	1.81	2.10	1.58	4.71	3.64	1.66	2.08	30.90

APPENDIX I

HYDROGRAPHIC DATA
FOR THE PERIOD
OCTOBER 1, 1916, TO SEPTEMBER 30, 1918

APPENDIX I

HYDROGRAPHIC DATA
FOR THE PERIOD
OCTOBER 1, 1916, TO SEPTEMBER 30, 1918

CHANGE OF YEAR

Previous to 1914, it was the custom for computations of stream flow to extend from January to December, inclusive; it has been decided, however, to change the ending of the stream gaging year from December 31 to September 30, because:

1. In Pennsylvania the draft period usually ends and the storage period begins about the end of September, as shown in a representative manner by the flow for a long period of years of the Susquehanna River at Harrisburg, where the drainage area is 24,100 square miles, a section equal to 53 per cent of the total area of the state.

2. By completing the computations before the end of the calendar year the annual reports can be published and distributed earlier.

3. The annual computation of the records can be completed in December which will give opportunity for securing a large number of measurements of stream flow under ice cover. These measurements will furnish exceptionally valuable information since the flow of the streams during frozen periods is an uncertain quantity, requiring approximations of the probable discharge from climatological records and from the flow of streams having similar physical characteristics.

4. The semi-annual gage inspection trips can be made during periods when discharge measurements can always be made and when levels can be run to ascertain the slope of the water surface at each gaging station in order to secure further data for the determination of the coefficient of roughness. A knowledge of this coefficient is essential in calculations necessary for action on applications for the construction of bridges and other encroachments as well as being of importance in other engineering studies.

5. It is in accord with the practice of the U. S. Geological Survey and it is desirable that there should be conformity in the methods pursued by the two organizations.

EXPLANATION OF TERMS USED IN APPENDIX

The volume of water flowing in a stream is expressed in various terms which may be divided into two groups:

(1) Those which represent a rate of flow; as, second-feet, gallons per minute, and run-off in second-feet per square mile, and (2) those which represent the actual quantity of water as, run-off in depth in inches. The units used in this series of reports are second-feet, second-feet per square mile and run-off in inches.

"Second-feet" is an abbreviation for cubic feet per second and is the unit for the rate of discharge of water in a stream 1 foot wide, 1 foot deep, flowing 1 foot per second. It is generally used as a fundamental unit from which others are computed by the use of factors given in the table of equivalents below.

"Second-feet per square mile" is the average number of cubic feet of water flowing from each square mile of area drained, on the assumption that the run-off is distributed uniformly in time and area.

"Run-off in inches" is the depth to which the drainage area would be covered if all the water flowing from it in a given period were conserved and uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches.

"Gage height" is a term used to indicate the fluctuating stages of a stream at a particular point, with reference to an established datum which does not change. Gage height has no reference to the depth of water but is merely the elevation of the water surface above a fixed point, while the zero of gage heights is generally below the minimum stage. For example, at Wilkes-Barre, on the North Branch Susquehanna River, when the gage height is 4.35 feet, the maximum depth of water in the river at that point is 18.5 feet. Where elevations are given it is understood they refer in feet to mean sea level, unless otherwise specified.

In the tables of estimated monthly discharges in the Hydrographic Data Appendix, the column headed "Maximum" gives the mean flow for the day when the mean gage height was the highest. In the column headed "Minimum" the quantity given is the mean flow for the day when the mean gage hight was the lowest. The column headed "Mean" is the average flow in cubic feet for each second during the month. The computations for run-off in second-feet per square mile and depth in inches are based on the value of the "Mean". The "Mean" for the year is obtained by dividing the total discharge by the number of days in the year, and the run-off in second-feet per square mile for the year is based on this figure.

In footnotes showing "Maximum", the gage height and consequently discharge is obtained by using during seasons of free flow the highest observed gage height or the crest shown from a hydrograph, the duration of the crests usually representing a small fraction of a day, and being the highest for the entire year.

The "Minimum" in footnotes is the lowest for the entire year.

CONVENIENT EQUIVALENTS

The following is a list of convenient equivalents for use in hydraulic computations:

1 second-foot equals 7.48 U. S. gallons per second; equals 448.8 gallons per minute; equals 646,272 gallons for one day.

1 second-foot equals 6.23 British Imperial Gallons per second.

1 second-foot for one year covers 1 square mile 1.131 feet or 13.57 inches deep.

1 second-foot for one year equals 31,536,000 cubic feet.

1 second-foot for one day covers 1 square mile 0.03719 inch deep.

1 second-foot for one 28 day month covers 1 square mile 1.041 inches deep.

1 second-foot for one 29 day month covers 1 square mile 1.079 inches deep.

1 second-foot for one 30 day month covers 1 square mile 1.116 inches deep.

1 second-foot for one 31 day month covers 1 square mile 1.153 inches deep.

1 foot per second equals 0.68 mile per hour.

100 United States gallons per minute equals 0.223 second-foot.

1,000,000 United States gallons per day equals 1.55 second-foot.

1 inch deep on 1 square mile equals 2,323,200 cubic feet.

1 mile-foot is 12 inches depth on one square mile and equals 27,878,400 cubic feet.

1 cubic foot equals 7.48 gallons.

1 cubic foot of water weighs 62.5 pounds.

1 horse-power equals 550 foot-pounds per second.

1 horse-power equals 746 watts; 1 kilowatt equals 1.34056 H. P.

1 horse-power equals 1 second-foot falling 8.80 feet, 100 per cent efficiency.

To calculate water power quickly $\frac{\text{Sec.-ft. x fall in feet}}{11} = \text{net}$ horse-power on shaft of water wheel realizing 80 per cent of theoretical power.

The State of Pennsylvania is divided into three main drainage basins: the Delaware, Susquehanna and Ohio. The hydrographic data in the following pages are divided into three groups, corresponding to these three basins. The stations in each basin are shown in

the following tables and their location is indicated on the map (Plate II) with reference number corresponding to those given in the tables.

TABLE NO. XXX

Gaging Stations in Delaware Basin. *

Station No.	Stream	Location
1	Lackawaxen River	Hawley
2	Wallenpaupack Creek	Wilsonville
3	Delaware River	Port Jervis, N. Y.
4	Bushkill Creek	Shoemakers
5	McMichaels Creek	Stroudsburg
6	Pocono Creek	Stroudsburg
7	Lehigh River	Tannery
8	Lehigh River	Bethlehem
9	Delaware River	Riegelsville
10	Schuylkill River	Schuylkill Haven
11	Little Schuylkill River	Tamaqua
12	Little Schuylkill River	Molino
13	Schuylkill River	Reading
14	Perkiomen Creek	Graters Ford
15	Brandywine Creek	Chadds Ford

*For information available on each station, see "Description of Station".

TABLE NO. XXXI

Gaging Stations in Susquehanna Basin. *

Station No.	Stream	Location
1	North Branch Susquehanna River	Binghamton, N. Y.
2	North Branch Susquehanna River	Towanda
3	Towanda Creek	Monroeton
4	Mehoopany Creek	Mehoopany
5	Tunkhannock Creek	Dixon
6	Bowman Creek	Eatonville
7	Lackawanna River	Moosic
8	North Branch Susquehanna River	Wilkes-Barre
9	Nescopeck Creek	St. Johns
10	Fishing Creek	Bloomsburg
11	North Branch Susquehanna River	Danville
12	West Branch Susquehanna River	Bower
13	West Branch Susquehanna River	Clearfield
14	Clearfield Creek	Dimeling
15	Moshannon Creek	Winburne
16	Driftwood Branch Sinnemahoning Creek	Sterling Run
17	Kettle Creek	Leidy
18	West Branch Susquehanna River	Renovo
19	Bald Eagle Creek	Milesburg
20	Spring Creek	Bellefonte
21	Bald Eagle Creek	Beech Creek Station
22	Pine Creek	Cedar Run
23	Pine Creek	Waterville
24	Lycoming Creek	Trout Run
25	West Branch Susquehanna River	Williamsport
26	West Branch Susquehanna River	Lewisburg
27	Susquehanna River	Sunbury
28	Susquehanna River	Selinsgrove
29	Frankstown Branch Juniata River	Williamsburg
30	Little Juniata River	Tyrone
31	Frankstown Branch Juniata River	Huntingdon
32	Raystown Branch Juniata River	Saxton
33	Tuscarora Creek	Port Royal
34	Juniata River	Newport
35	Conodoguinet Creek	Bryson's Bridge
36	Susquehanna River	Harrisburg
37	Yellow Breeches Creek	Olmstead's Mill
38	Codorus Creek	York

*For information available on each station, see "Description of Station".

TABLE NO. XXXII

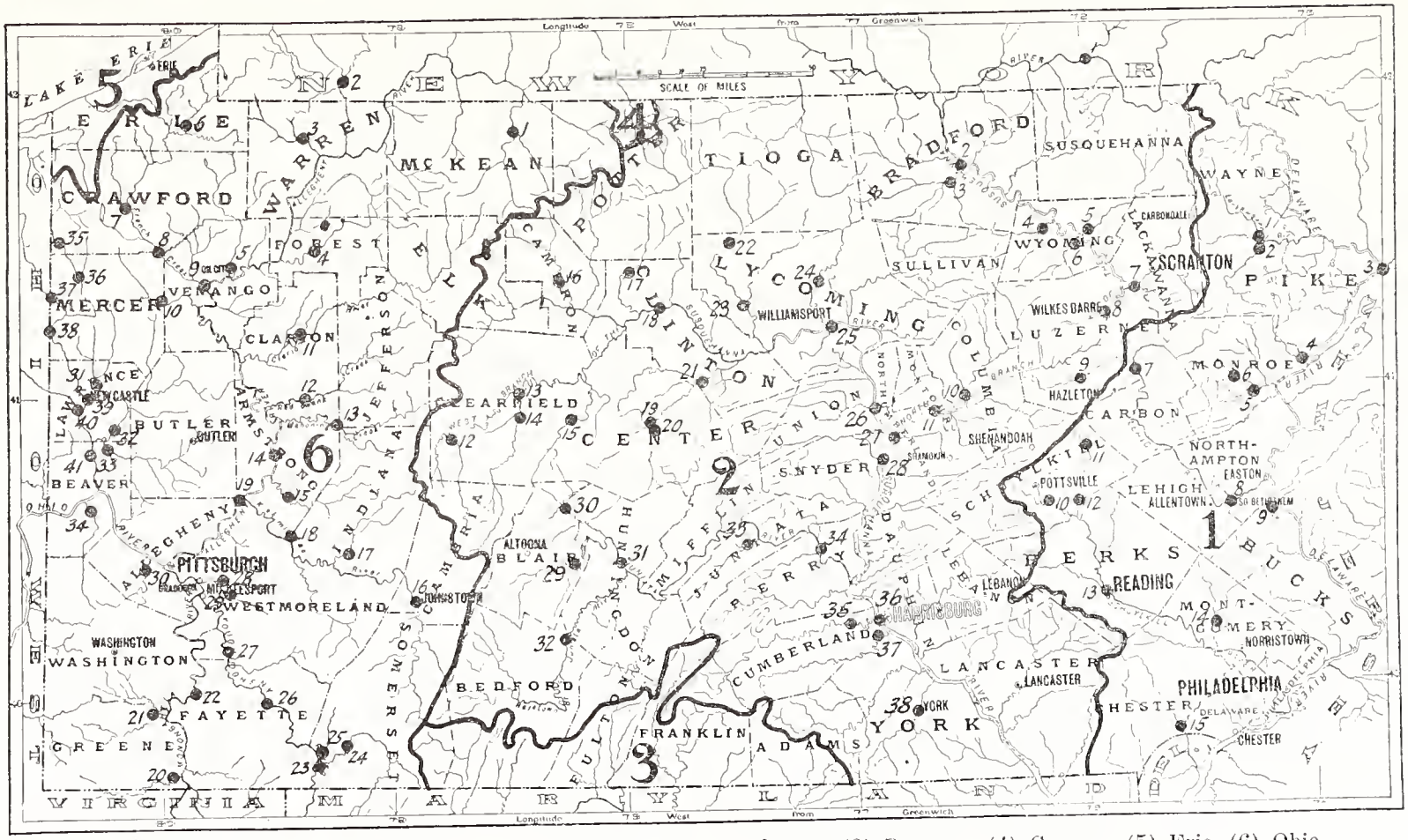
Gaging Stations in Ohio Basin *

Station No.	Stream	Location
1	Allegheny River	Larabee
2	Conewango Creek	Frewsburg
3	Brokenstraw Creek	Youngsville
4	Tionesta Creek	Butler Bridge
5	Oil Creek	Rouseville
6	French Creek	Kimmeytown
7	Cussewago Creek	Meadville
8	French Creek	Carlton
9	Allegheny River	Franklin
10	Sandy Creek	Sandy Lake
11	Clarion River	Clarion
12	Red Bank Creek	Saint Charles
13	Mahoning Creek	Dayton
14	Allegheny River	Kittanning
15	Crooked Creek	Hileman's Farm
16	Stony Creek	Johnstown
17	Blaeklick Creek	Blaeklick
18	Kiskiminitas River	Avonmore
19	Allegheny River	Freeport
20	Dunkard Creek	"Bobtown"
21	South Fork Ten Mile Creek	Pollocks Mill
22	Monongahela River	South Brownsville
23	Youghiogheny River	Confluence
24	Casselman River	Markleton
25	Laurel Hill Creek	Ursina
26	Youghiogheny River	Connellsville
27	Youghiogheny River	Sutersville
28	Turtle Creek	Trafford
29	Brush Creek	Trafford
30	Chartiers Creek	Carnegie
31	Neshannock Creek	Eastbrook Station
32	Slippery Rock Creek	Wurtemburg
33	Connoquenessing Creek	Hazen (Celia)
34	Raccoon Creek	Moffatt's Mill
35	Shenango River	Turnerville
36	Little Shenango River	Greenville
37	Pymatuning Creek	Orangeville
38	Shenango River	Sharon
39	Shenango River	New Castle
40	Mahoning River	New Castle
41	Beaver River	Newport

*For information available on each station, see "Description of Station".

WATER SUPPLY COMMISSION OF PENNSYLVANIA

MAP SHOWING LOCATION OF GAGING STATIONS FOR THE PERIOD OCTOBER 1, 1916, TO SEPTEMBER 30, 1918



Legend,—Drainage Basins—(1) Delaware, (2) Susquehanna, (3) Potomac, (4) Genesee, (5) Erie, (6) Ohio.

DELAWARE BASIN

LACKAWAXEN RIVER AT HAWLEY

DESCRIPTION OF STATION

Location—At single span, steel, through truss, highway bridge about 2,000 feet above the mouth of Wallenpaupack Creek at Hawley, Wayne County.

Records Available—Discharge complete from July 2, 1908, to July 31, 1913, and from October 1, 1913, to September 30, 1917; discharge measurements and gage heights from October 1, 1917, to September 30, 1918. For other records on this river see Lackawaxen River at Rowlands in the 1914 and 1915 reports of the Water Supply Commission.

Drainage Area—290 square miles.

Gage—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge and is read twice daily by J. S. Pennell.

Channel—The right bank overflows in extreme stages, the left bank is high and does not overflow, and the bed is composed of gravel and rock.

Remarks—Intermittent storage upstream at Honesdale affects the flow during low stages.

Discharge Measurements of Lackawaxen River at Hawley, Wayne County
(Drainage area 290 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq.ft.	Feet	Sec.-ft.	
19	Feb. 9	Boehringer, Wilson & Brown	104	1.70	144	Under ice cover
20	Feb. 16	Wilson & Brown	86	1.59	128	Under ice cover
21	Feb. 23	Wilson & Brown	103	1.77	168	Under ice cover
22	Mar. 1	Wilson & Brown	634	5.35	587	Ice jam below bridge
23	April 11	Brown	346	2.75	582	0.2 & 0.8 method
24	April 21	Brown	251	2.01	395	0.2 & 0.8 method
25	July 13	Brown & Heagy	262	2.20	366	0.2 & 0.8 method
	1918					
26	Jan. 17	Wilson	93	2.08	126	Under ice cover

Daily Mean Gage Heights, in feet, of Lackawaxen River at Hawley, Wayne County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916–1917												
1	0.51	0.24	1.6	-------	-------	-------	4.3	1.5	2.2	2.2	0.88	1.0
2	0.57	0.41	1.4	-------	-------	-------	4.4	1.6	2.6	2.2	0.95	0.92
3	0.49	0.46	1.2	-------	-------	-------	4.3	1.5	2.7	3.0	0.91	0.88
4	0.48	0.42	1.1	-------	-------	-------	3.6	1.4	2.4	2.9	0.81	0.81
5	0.29	0.15	1.0	-------	-------	-------	3.4	2.2	2.2	2.7	0.60	0.66
6	0.30	0.34	1.0	-------	-------	-------	3.3	3.4	2.3	2.5	0.72	0.60
7	0.45	0.45	0.89	-------	-------	-------	3.8	3.0	2.7	2.7	0.84	0.62
8	0.21	0.35	0.81	-------	-------	-------	3.4	3.0	2.7	1.9	1.4	0.62
9	0.29	0.48	1.0	-------	-------	2.8	3.4	3.1	2.5	1.7	2.9	0.24
10	0.29	0.34	‖0.93	-------	-------	2.0	3.1	2.8	2.2	1.7	2.8	0.56
11	0.23	0.52	0.86	-------	-------	2.2	2.8	2.5	2.5	2.3	2.3	0.65
12	0.24	0.21	0.91	-------	-------	4.8	2.7	2.3	4.9	2.6	1.9	‖0.60
13	0.21	0.32	*	-------	-------	4.1	2.6	2.1	4.3	2.2	1.4	0.55
14	0.27	0.55	-------	-------	-------	4.0	2.4	2.0	3.8	1.8	1.2	0.50
15	0.31	0.56	-------	-------	-------	3.0	2.3	1.7	3.5	1.9	1.1	0.55
16	0.47	0.55	-------	-------	-------	2.8	2.1	1.6	3.4	1.9	1.6	0.20
17	0.27	0.49	-------	-------	-------	2.9	2.0	1.7	3.2	1.6	1.2	0.35
18	0.31	0.48	-------	-------	-------	2.7	2.0	1.8	2.9	1.5	1.2	0.40
19	0.09	‡0.08	-------	-------	-------	2.4	1.9	1.6	2.6	1.4	0.90	0.44
20	0.65	0.41	-------	-------	-------	2.3	2.0	1.5	2.7	1.4	0.92	0.40
21	1.4	0.32	-------	-------	-------	2.4	2.0	1.4	2.5	1.4	0.86	0.30
22	2.3	0.32	-------	-------	-------	2.6	1.9	1.4	2.2	1.5	0.85	0.36
23	1.0	0.35	-------	-------	-------	3.2	‖1.8	1.5	2.0	1.4	0.85	0.10
24	0.67	0.72	-------	-------	-------	6.0	1.7	1.5	3.2	1.4	1.2	0.24
25	0.64	1.1	-------	-------	-------	5.6	1.6	1.4	2.8	1.4	1.8	0.30
26	0.55	0.90	-------	-------	-------	5.7	1.4	1.3	3.1	1.2	1.4	0.32
27	0.48	0.75	-------	-------	-------	6.2	1.5	1.3	3.1	1.0	1.4	0.20
28	0.44	0.70	-------	-------	-------	†6.7	1.6	1.6	2.7	1.0	0.99	0.18
29	0.54	0.76	-------	-------	-------	5.8	1.4	3.1	2.3	0.92	0.84	0.18
30	0.44	1.5	-------	-------	-------	4.9	1.4	3.2	2.3	0.92	1.1	0.10
31	0.34	-------	-------	-------	-------	4.3	-------	2.7	-------	0.96	1.2	-------

Notes—*River frozen December 13, 1916 to February 27, 1917; backwater from ice jam February 28 to March 8, 1917. †Maximum 6.9 feet at 6.45 a. m. ‡Minimum 0.00 feet at 10:30 a. m. ‖Interpolated.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917–1918												
1	0.40	5.5	1.4	-------	2.1	4.3	2.1	3.0	2.4	0.66	0.52	0.44
2	0.65	4.2	1.6	-------	2.1	4.1	2.0	2.8	2.1	0.73	0.40	0.58
3	0.60	3.6	1.5	-------	2.1	* 4.0	2.2	2.6	1.6	0.65	0.34	0.45
4	0.45	3.0	1.4	-------	2.0	3.6	2.2	2.4	1.4	0.53	0.14	0.38
5	0.35	2.8	1.4	-------	2.0	3.4	2.0	2.3	1.3	0.50	0.14	0.34
6	0.35	2.4	1.3	-------	2.2	4.2	1.8	2.2	1.2	0.60	0.29	0.34
7	0.15	2.2	1.3	-------	2.0	4.4	1.7	2.1	1.2	0.20	0.34	0.24
8	0.48	2.1	1.2	-------	2.1	3.9	1.6	1.9	1.3	0.56	0.26	0.04
9	0.35	1.8	1.2	-------	2.0	3.4	‖1.6	1.8	1.0	0.43	0.40	0.24
10	0.56	1.7	1.1	-------	2.2	‖3.5	1.7	1.6	1.0	0.53	0.32	0.08
11	0.40	1.6	*	1.9	2.2	3.6	2.6	1.6	1.0	0.51	0.04	‡0.06
12	0.28	1.5	-------	2.0	2.2	3.3	2.6	1.5	1.3	0.50	0.34	0.36
13	1.1	1.4	-------	2.2	2.3	3.8	2.6	1.4	1.5	0.43	0.52	0.66
14	1.1	1.3	-------	2.2	3.5	4.6	3.2	2.3	1.2	0.55	0.39	0.78
15	0.98	1.4	-------	2.2	4.0	5.2	4.8	2.0	1.2	0.53	0.70	0.54
16	0.80	1.3	-------	2.2	5.1	4.6	5.1	1.7	0.90	0.43	0.42	0.52
17	0.71	1.2	-------	2.1	5.1	4.0	4.9	1.6	0.83	0.50	0.32	0.49
18	0.52	1.2	-------	2.2	4.5	4.1	5.4	1.4	0.75	0.55	0.04	0.56
19	0.61	1.3	-------	2.2	4.4	4.2	5.0	1.3	0.69	0.53	0.04	0.94
20	1.2	1.2	-------	2.2	6.2	4.5	4.2	1.3	‖0.61	0.20	0.10	0.85
21	1.3	1.2	-------	2.1	6.2	4.2	4.7	1.4	0.53	0.05	—0.01	1.6
22	1.1	2.0	-------	2.1	5.0	4.4	5.9	1.7	1.9	0.57	0.26	1.5
23	1.1	2.2	1.5	2.2	4.0	4.1	5.5	1.7	1.3	0.23	0.12	1.5
24	1.5	2.0	1.6	2.1	3.5	3.6	4.6	1.6	1.2	0.47	0.14	0.92
25	3.1	1.4	1.6	2.1	3.4	3.5	3.8	1.3	1.2	0.33	—0.06	0.79
26	2.7	1.4	1.6	2.2	5.2	3.0	3.4	1.4	0.93	0.30	0.10	1.7
27	2.2	1.6	1.6	2.1	5.5	2.8	3.0	1.3	0.67	0.20	0.05	2.7
28	2.8	1.6	1.6	2.1	4.7	2.6	2.8	1.4	0.70	0.15	0.02	2.2
29	2.8	1.5	1.6	2.1	-------	2.4	2.8	1.3	0.60	0.30	0.02	1.5
30	†5.8	1.4	-------	2.1	-------	2.2	2.9	3.2	0.55	0.33	0.06	1.4
31	7.0	-------	-------	2.1	-------	2.2	-------	2.9	-------	0.40	0.10	-------

Notes—*Gage heights affected by ice December 11, 1917, to February 20, 1918. ‖Interpolated †Maximum 10.0 feet hydrograph at 6 p. m. ‡Minimum —0.21 feet.

Daily discharge, in second-feet, of Lackawaxen River at Hawley, Wayne County, for the year ending September 30, 1917

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	65	41	244	69	128	580	1,300	222	396	396	111	128
2	71	55	202	69	182	458	1,360	244	524	396	121	117
3	63	60	162	74	162	396	1,300	222	560	678	115	111
4	62	56	144	86	152	368	950	202	458	638	101	101
5	45	35	128	144	144	560	854	396	396	560	74	81
6	46	49	128	144	136	808	808	854	426	490	83	74
7	59	59	113	136	128	720	1,050	678	560	560	106	76
8	39	50	101	182	128	658	854	678	560	314	202	76
9	45	62	128	182	144	598	854	720	490	266	638	41
10	45	49	118	222	142	340	720	598	396	266	598	70
11	46	66	108	244	136	396	598	490	490	426	426	80
12	41	59	115	222	133	1,580	560	426	1,630	524	314	74
13	39	48	*107	202	128	1,200	524	368	1,300	396	202	69
14	44	69	100	192	128	1,150	458	340	1,050	290	162	64
15	47	76	93	172	128	678	426	266	902	314	144	69
16	61	69	80	162	128	598	368	244	854	314	244	38
17	44	63	74	144	114	638	340	266	764	244	162	50
18	47	62	69	138	136	560	340	290	630	222	162	54
19	31	‡31	64	121	153	458	314	244	524	202	114	58
20	80	55	64	107	144	426	340	222	560	202	117	54
21	202	48	59	107	162	458	340	202	490	202	100	46
22	426	48	86	93	153	524	314	202	396	222	107	51
23	128	50	128	107	168	764	290	222	340	202	107	32
24	82	89	128	93	182	2,290	266	222	764	202	162	41
25	79	144	114	86	192	2,040	244	202	598	202	290	46
26	69	114	107	80	172	2,100	202	182	720	162	202	48
27	62	93	100	74	206	2,420	222	182	720	128	202	38
28	58	86	100	69	900	†2,750	244	244	560	128	127	37
29	68	94	93	74	-------	2,160	202	720	426	117	106	37
30	58	222	86	64	-------	1,630	202	764	426	117	144	32
31	49	-------	74	93	-------	1,300	-------	560	-------	122	162	-------

NOTES—*River frozen December 13, 1916 to February 27, 1917; backwater from ice jam February 28 to March 8, 1917, and discharge estimated from four current meter measurements, together with climatological data. †Maximum = 2,830 second-feet. ‡Minimum = 26 second-feet.

Estimated Monthly Discharge of Lackawaxen River at Hawley, Wayne County
(Drainage Area 290 Square Miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	426	31	74	0.26	0.30
November	222	‡31	69	0.24	0.27
December	-------	-------	110	0.38	0.44
January	-------	-------	127	0.44	0.51
February	-------	-------	178	0.61	0.64
March	†2,750	-------	1,020	3.52	4.06
April	1,360	202	561	1.93	2.15
May	854	182	377	1.30	1.50
June	1,630	340	631	2.18	2.41
July	678	117	507	1.66	1.22
August	638	74	191	0.66	0.76
September	128	32	63	0.22	0.24
The year	2,750	31	309	1.07	14.50

NOTES—River frozen December 13, 1916 to February 27, 1917; backwater from ice jam February 28 to March 8, 1917, and discharge estimated from 4 current meter measurements together with climatological data. †Maximum 2,800 second-feet March 28, 1917. ‡Minimum 26 second-feet November 19, 1916.

DELAWARE BASIN—STATION NO. 2

WALLENPAUPACK CREEK AT WILSONVILLE

DESCRIPTION OF STATION

Location—At two span, steel, highway bridge at Wilsonville, 1½ miles above the month at Hawley, Wayne County.

Records Available—Discharge measurements 1908 to 1917 inclusive; gage heights 1909 to 1913 and daily and monthly discharges from January 1, 1910, to September 30, 1918, inclusive, except for intermittent periods.

Drainage Area—239 square miles.

Gage—A vertical staff gage, whose elevation of zero is 1,146.78 feet above mean sea level, is located on the downstream face of the pier. A Barrett and Lawrence automatic gage, referred to same datum as the staff gage, is located on the top of the pier, and supplements the readings taken from the staff gage. Both gages are read by an employe of L. B. Stillwell and H. S. Putnam, Consulting Engineers, New York City.

Channel—The right bank overflows at extreme stages, the left bank is high and does not overflow, and the bed is composed of solid rock.

Remarks—There is a low log weir located approximately 70 feet downstream from the gage. Thirty-five feet above the gage is a 3 foot concrete dam, upon which flashboards are placed during periods of low flow in order to provide storage for the operation of the silk mills below.

The following record has been compiled and computed from data furnished by L. B. Stillwell and H. S. Putnam Consulting Engineers, New York City, who have made a comprehensive study of this stream.

Discharge Measurements of Wallenpaupack Creek, at Wilsonville, Wayne County
(Drainage area 239 square miles)

No	Date	Hydrographers	Area	G.H.	Dis.	Remarks
	1917		Sq. ft	Feet	Sec. ft.	
22	April 11	Brown	299	1.81	607	0.2 & 0.8 method
23	April 21	Brown	247	1.37	348	0.2 & 0.8 method
24	July 13	Brown & Heagy	251	1.44	386	0.2 & 0.8 method

Daily discharge, in second-feet, of Wallenpaupack Creek at Wilsonville, Wayne County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	109	*54	261	172	219	500	1,275	264	545	495	116	138
2	105	98	271	172	194	428	1,275	283	488	392	138	130
3	106	88	271	172	194	330	1,222	280	707	348	118	122
4	*89	80	146	172	172	271	970	244	705	294	88	113
5	*65	*26	146	219	172	271	970	298	596	253	*40	97
6	*71	*81	138	330	150	219	880	608	592	217	*74	90
7	*97	*75	138	464	150	219	880	745	736	399	*76	86
8	*81	*53	111	464	150	219	880	718	804	266	173	83
9	*84	*63	94	392	150	229	880	736	754	204	514	*22
10	*71	*65	130	392	130	255	835	727	604	232	707	*73
11	*64	86	130	330	130	330	745	664	556	358	*711	83
12	*67	*32	130	271	130	464	660	528	608	529	430	80
13	*60	*69	130	172	130	790	660	478	1,205	512	275	90
14	*54	99	130	271	130	880	620	457	2,020	321	214	86
15	*58	*68	130	540	111	835	620	406	1,716	232	167	79
16	*53	*48	130	620	111	660	540	351	1,519	214	168	*24
17	*47	*60	130	580	111	580	464	*330	1,370	214	255	*71
18	*45	77	111	464	111	620	464	300	1,239	212	204	85
19	*47	*42	94	392	111	620	428	306	964	185	152	85
20	*88	89	94	330	111	464	428	306	795	154	126	*63
21	183	*78	111	330	130	500	392	303	680	150	113	*51
22	187	*98	111	300	130	428	392	277	620	216	109	*43
23	178	*112	172	300	130	428	360	278	520	261	118	*9
24	126	130	219	300	172	620	330	303	612	277	234	*71
25	93	160	194	244	219	880	330	274	835	258	393	102
26	98	146	194	219	244	1,480	330	252	822	214	336	106
27	92	130	194	150	330	1,590	300	229	709	174	242	*81
28	82	*52	219	150	540	1,710	300	219	688	152	181	*52
29	*54	*52	219	130	-------	2,460	271	364	564	132	138	*44
30	80	*10	219	150	-------	1,830	271	764	572	132	126	*8
31	*83	-------	194	150	-------	1,480	-------	777	-------	126	146	-------
1917-1918												
1	*56	1,894	204	97	413	1,275	309	826	508	88	89	*34
2	93	1,023	202	94	406	1,070	289	821	390	97	84	104
3	*80	699	199	94	386	880	258	745	274	95	*62	97
4	*45	536	194	94	330	835	229	636	227	*50	*41	93
5	*47	572	194	90	336	835	172	608	196	73	*44	92
6	*39	489	185	90	271	808	172	582	234	76	*49	87
7	*8	421	172	94	219	790	219	446	187	*40	*9	89
8	*56	357	172	86	172	826	271	417	165	75	*71	88
9	87	289	150	86	172	835	450	586	170	81	81	90
10	88	250	172	86	172	880	446	413	204	*61	*60	90
11	*61	214	150	94	163	867	403	435	249	*44	*13	93
12	*51	192	172	97	150	880	389	460	212	*47	*64	85
13	*60	178	158	104	219	880	432	450	180	*58	87	84
14	204	193	172	111	392	970	1,002	439	172	*8	92	94
15	130	172	154	111	580	1,380	1,191	564	168	*53	*67	92
16	128	165	138	111	790	1,480	1,233	424	130	*58	*47	90
17	108	152	138	130	745	1,212	1,890	344	116	*56	*50	90
18	96	154	150	219	718	1,170	2,155	324	107	109	*28	88
19	108	130	154	219	760	970	2,128	285	96	*47	*57	104
20	128	132	154	271	684	880	2,148	258	86	*31	*46	111
21	205	134	150	309	970	970	2,194	280	81	*63	*43	225
22	222	155	130	406	1,330	952	2,207	360	83	*63	*48	275
23	156	260	130	406	970	899	2,058	393	46	*61	*44	197
24	171	252	130	406	880	817	1,822	342	132	*54	*33	132
25	591	152	122	428	880	741	1,372	255	134	*49	*9	110
26	741	172	122	428	835	636	1,035	237	115	*47	*69	255
27	632	165	118	428	1,070	520	902	226	99	*28	*56	427
28	512	158	111	428	1,480	427	790	207	90	*9	*54	355
29	644	158	114	428	-------	399	754	214	85	*54	*41	229
30	1,945	161	111	428	-------	370	790	278	60	*53	*39	176
31	2,633	-------	107	428	-------	330	-------	528	-------	*60	*28	-------

Note—*Leakage flow estimated.

Estimated Monthly Discharge of Wallenpaupack Creek at Wilsonville, Wayne County
(Drainage Area 239 Square Miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	187	*45	88	0.37	0.43
November	160	*10	77	0.32	0.36
December	271	94	160	0.67	0.77
January	620	130	301	1.26	1.45
February	540	111	170	0.71	0.74
March	2,400	219	727	3.04	3.51
April	1,275	271	632	2.64	2.94
May	777	219	422	1.77	1.98
June	2,020	488	838	3.51	3.92
July	529	126	262	1.10	1.23
August	*711	*40	222	0.93	1.04
September	138	*8	76	0.32	0.36
The year	2,400	* 8	332	1.39	18.73
1917-1918					
October	2,033	*8	307	1.28	1.48
November	1,894	130	333	1.39	1.55
December	204	107	153	.64	.74
January	428	86	226	.95	1.10
February	1,480	150	587	2.46	2.56
March	1,480	330	864	3.61	4.16
April	2,207	172	990	4.14	4.62
May	831	207	424	1.77	2.04
June	508	46	167	.70	.78
July	109	*8	58	.24	.28
August	92	*9	52	.22	.25
September	427	*34	140	.59	.66
The year	2,207	*8	356	1.49	20.22

NOTE—*Leakage flow estimated.

DELAWARE BASIN—STATION NO. 3

DELAWARE RIVER AT PORT JERVIS, N. Y.

DESCRIPTION OF STATION

Location—At two span, steel, through truss, highway bridge between Port Jervis, New York, and Matamoras, Pa.

Records Available—Discharge complete from October 12, 1904, to September 30, 1918. For other records on this river see Delaware River at Riegelsville; also Delaware River at Lambertville, N. J., in the 1910-11 Report of the Water Supply Commission.

Drainage Area—3,250 square miles.

Gage—A sloping and vertical staff gage, whose elevation of zero is 414.89 feet above mean sea level, is located on the left bank and abutment and is read twice daily by Belle Fuller.

Channel—Both banks are high and do not overflow, and the bed is composed of gravel.

Remarks—The following data have been furnished by the U. S. Geological Survey, who maintain and operate this station.

Discharge Measurements of Delaware River at Port Jervis, N. Y.
(Drainage area 3,250 square miles)

No.	Date	Hydrographers	Area	G.H.	Dis.	Remarks
	1917		Sq. ft	Feet	Sec. ft.	
56	Feb. 16	Burchard	820	5.28	1,490	Under ice cover 0.2 & 0.8 method
57	March 11	Burchard	1,590	6.13	3,840	Under ice cover 0.2 & 0.8 method
58	March 30	Burchard	5,160	7.92	26,600	0.2 & 0.8 method
59	Oct. 17	Burchard	1,880	2.37	1,800	0.2 & 0.8 method
	1918					
60	Feb. 8	Covert	870	3.19	1,170	Through partial ice cover 0.2 & 0.8 method
61	Mar. 12	Burchard	3,230	4.82	9,450	0.2 & 0.8 method
62	Mar. 12	Burchard	3,270	4.80	9,540	0.2 & 0.8 method
63	June 8	Moulton	2,150	3.10	3,330	0.2 & 0.8 method
64	Aug. 13	Burchard	295	1.50	650	0.2 & 0.8 method
65	Aug. 13	Burchard	361	1.53	657	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Delaware River at Port Jervis, N. Y., for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	2.3	2.3	5.5	3.2	-------	-------	7.4	3.5	3.9	5.0	2.6	3.5
2	2.5	2.3	4.8	3.2	-------	-------	8.0	3.4	4.0	4.6	2.4	3.0
3	2.4	2.35	4.2	3.2	-------	-------	7.6	3.8	4.2	4.3	2.2	2.8
4	2.4	2.4	4.0	3.3	-------	-------	7.5	3.7	4.1	4.0	2.3	2.7
5	2.15	2.4	3.7	3.3	-------	-------	6.5	3.6	4.0	3.8	2.2	2.6
6	2.0	2.3	3.7	4.0	-------	-------	6.0	3.7	3.9	3.6	2.1	2.5
7	2.3	2.3	3.5	4.6	-------	-------	6.5	3.8	4.3	3.5	2.2	2.4
8	2.0	2.5	3.3	4.4	-------	-------	5.9	3.5	5.8	3.3	2.1	2.3
9	1.9	2.3	3.2	4.0	-------	-------	5.8	4.6	5.7	3.1	3.1	2.3
10	1.9	2.3	3.4	4.0	-------	-------	5.3	4.5	5.2	3.2	3.5	2.2
11	1.8	2.35	3.4	3.8	-------	-------	4.8	4.4	4.9	3.8	3.4	2.2
12	1.7	2.6	3.3	3.4	-------	-------	4.6	4.3	8.7	4.4	3.0	2.2
13	1.75	2.5	3.1	3.1	-------	-------	4.5	4.1	7.7	4.7	2.7	2.1
14	1.80	2.3	3.0	3.9	-------	-------	4.3	3.7	6.4	4.3	2.4	2.0
15	1.9	2.3	3.0	9.2	-------	8.3	4.2	3.6	6.4	3.9	2.3	1.9
16	1.95	2.3	2.8	7.2	-------	7.5	4.2	3.6	5.7	3.8	2.2	1.9
17	2.0	2.35	2.8	6.0	-------	7.0	4.0	3.5	5.3	3.6	2.4	1.8
18	1.9	2.25	2.6	4.9	-------	6.1	3.8	3.5	5.0	3.9	2.7	1.8
19	1.85	2.25	2.6	4.0	-------	5.8	3.7	3.3	5.0	3.5	2.9	1.8
20	3.6	2.2	2.9	*	-------	5.2	3.9	3.2	4.8	3.4	2.6	1.8
21	3.2	2.2	3.0	-------	-------	5.0	4.3	3.1	4.4	3.2	2.4	1.7
22	3.8	2.1	3.5	-------	-------	5.2	4.4	3.0	4.6	3.1	2.3	1.7
23	3.4	2.1	3.8	-------	-------	5.0	4.5	3.0	4.3	2.9	2.2	1.7
24	3.1	2.2	4.6	-------	-------	5.9	4.0	3.1	4.5	3.0	2.3	1.7
25	2.9	2.5	4.4	-------	-------	10.3	3.8	2.9	4.3	3.0	3.3	1.7
26	2.7	3.3	3.8	-------	-------	8.8	3.7	2.9	4.0	3.2	3.6	1.7
27	2.6	3.0	3.7	-------	-------	9.3	3.7	2.8	4.0	3.0	3.2	1.6
28	2.5	2.8	3.6	-------	-------	11.3	3.5	3.0	6.1	3.0	2.9	1.6
29	2.45	3.1	3.6	-------	-------	9.5	3.3	3.2	5.2	2.8	2.6	1.6
30	2.3	3.3	3.3	-------	-------	7.8	3.2	4.4	5.3	2.6	2.5	1.6
31	2.3	-------	3.2	-------	-------	7.0	-------	4.1	-------	2.5	4.0	-------

NOTE—*River frozen January 20 to March 14, 1917, inclusive.

Daily Mean Gage Heights, in feet, of Delaware River at Port Jervis, N. Y., for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.5	8.8	2.9	3.0	3.2	5.9	4.2	4.5	4.3	2.5	1.6	1.65
2	1.5	6.8	3.0	3.0	3.1	8.1	4.4	4.3	4.2	2.3	1.7	1.7
3	1.5	5.7	3.0	3.0	3.1	6.7	4.6	4.2	3.8	2.5	1.6	1.9
4	1.8	5.1	3.0	3.0	3.1	5.9	4.8	3.9	3.3	2.4	1.55	1.75
5	1.6	4.6	2.9	3.0	3.1	5.4	4.7	3.8	3.3	2.25	1.6	1.6
6	1.6	4.3	2.7	2.9	3.1	5.4	4.6	3.7	3.2	2.0	1.5	1.6
7	1.7	4.0	2.4	2.9	3.1	7.0	4.0	3.6	3.2	2.0	1.45	1.5
8	1.8	3.9	2.3	2.8	3.2	5.9	3.8	3.5	3.1	2.1	1.5	1.45
9	1.9	3.6	2.1	3.0	3.2	5.4	3.7	3.2	3.2	2.2	1.5	1.4
10	1.8	3.3	*2.3	3.1	3.2	5.1	5.0	3.1	2.9	2.1	1.55	1.3
11	1.7	3.3	2.5	3.1	3.2	5.5	5.1	3.0	2.7	2.1	1.55	1.25
12	1.6	3.2	2.9	3.2	3.1	4.8	4.8	2.9	2.8	2.15	1.5	1.25
13	1.9	3.0	2.8	3.3	3.2	4.5	4.7	3.5	3.0	2.15	1.6	1.25
14	3.2	2.9	2.7	3.3	3.5	5.9	4.6	4.4	3.8	2.2	1.6	1.35
15	2.7	2.8	2.6	3.4	3.9	6.1	5.7	4.1	3.4	2.3	1.8	1.65
16	2.5	2.8	3.0	3.4	4.4	5.5	6.3	3.7	3.2	2.45	1.8	1.6
17	2.4	2.8	3.0	3.5	5.9	5.3	5.9	3.5	2.9	2.25	1.6	1.5
18	2.4	2.7	3.1	3.3	5.8	6.1	6.1	3.3	2.7	2.2	1.5	1.5
19	2.3	2.6	3.1	3.3	5.6	6.3	6.4	3.2	2.6	2.2	1.35	1.7
20	2.3	2.6	3.1	3.2	5.4	6.7	5.8	3.2	2.5	2.2	1.25	1.85
21	3.5	2.5	3.1	3.1	9.0	7.0	5.4	4.0	2.4	2.2	1.2	2.25
22	3.3	2.5	3.1	3.0	8.2	7.2	6.8	3.8	2.5	2.0	1.15	2.8
23	3.1	3.5	3.0	3.0	6.1	7.5	7.1	3.8	3.8	1.95	1.1	2.6
24	2.9	3.4	2.9	3.4	5.2	6.9	6.3	3.6	3.5	1.8	1.1	2.4
25	3.5	3.2	2.9	3.3	4.6	6.1	5.8	3.3	3.1	1.7	1.1	2.2
26	4.8	3.1	2.9	3.2	4.7	5.7	5.3	3.3	2.9	1.6	1.1	2.3
27	4.3	3.0	2.9	3.2	9.0	5.3	4.8	3.5	2.7	1.6	1.2	4.2
28	4.0	2.9	2.8	3.1	7.6	4.8	4.5	4.0	2.5	1.5	1.1	4.4
29	4.3	2.8	3.1	3.1	-------	4.4	4.2	4.0	2.4	1.5	1.2	3.7
30	4.9	2.7	3.0	3.1	-------	4.3	4.1	4.0	2.3	1.5	1.2	3.2
31	12.3	-------	2.9	3.1	-------	4.2	-------	4.6	-------	1.7	1.2	-------

NOTES—*Gage heights affected by ice December 10, 1917, to February 19, 1918.

Daily discharge, in second-feet, of Delaware River at Port Jervis, N. Y. for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1,720	1,720	12,100	3,650	1,900	12,000	23,200	4,460	5,680	9,840	2,260	4,460
2	2,070	1,720	9,010	3,650	3,200	15,000	27,500	4,180	6,010	8,200	1,890	3,160
3	1,890	1,800	6,700	3,650	4,200	6,500	24,600	5,360	6,700	7,060	1,550	2,690
4	1,890	1,890	6,010	3,910	3,000	4,800	23,900	5,050	6,350	6,010	1,720	2,470
5	1,470	1,890	5,050	3,910	1,900	4,600	17,400	4,750	6,010	5,360	1,550	2,260
6	1,240	1,720	5,050	6,010	1,200	6,000	14,600	5,050	5,680	4,750	1,390	2,070
7	1,720	1,720	4,460	8,200	1,400	4,000	17,400	5,360	7,060	4,460	1,550	1,590
8	1,240	2,070	3,910	7,430	1,700	4,000	14,100	4,460	13,600	3,910	1,390	1,720
9	1,110	1,720	3,650	6,010	2,600	4,000	13,600	8,200	13,100	3,400	3,400	1,720
10	1,110	1,720	4,180	6,010	1,900	4,600	11,200	7,810	10,700	3,650	4,460	1,550
11	990	1,800	4,180	5,360	2,400	4,200	9,010	7,430	9,420	5,360	4,180	1,550
12	880	2,260	3,910	4,180	1,900	4,600	8,200	7,060	32,700	7,430	3,160	1,550
13	935	2,070	3,400	3,400	1,700	11,000	7,810	6,350	25,300	8,600	2,470	1,390
14	990	1,720	3,160	5,680	1,600	26,000	7,060	5,050	16,800	7,060	1,890	1,240
15	1,110	1,720	3,160	36,500	1,600	29,700	6,700	4,750	16,800	5,680	1,720	1,110
16	1,180	1,720	2,690	21,800	1,700	23,900	6,700	4,750	13,100	5,360	1,550	1,110
17	1,240	1,800	2,690	14,600	1,600	20,500	6,010	4,460	11,200	4,750	1,890	990
18	1,110	1,640	2,260	*9,420	1,600	15,100	5,360	4,460	9,840	5,680	2,470	990
19	1,050	1,640	2,260	6,010	1,400	13,600	5,050	3,910	9,840	4,460	2,920	990
20	4,750	1,550	2,920	*5,000	1,200	10,700	5,680	3,650	9,010	4,180	2,260	990
21	3,650	1,550	3,160	4,600	1,400	9,840	7,060	3,400	7,430	3,650	1,890	880
22	5,360	1,390	4,460	4,200	1,200	10,700	7,430	3,160	8,200	3,400	1,720	880
23	4,180	1,390	5,360	4,000	1,000	9,840	7,810	3,160	7,060	2,920	1,550	880
24	3,400	1,550	8,200	3,400	1,200	14,100	6,010	3,400	7,810	3,160	1,720	880
25	2,920	2,070	7,430	3,200	1,100	45,200	5,360	2,920	7,060	3,160	3,910	880
26	2,470	3,910	5,360	2,800	1,400	33,500	5,050	2,920	6,010	3,650	4,750	880
27	2,260	3,160	5,050	2,600	1,700	37,300	5,050	2,690	6,010	3,160	3,650	780
28	2,070	2,690	4,750	2,400	7,500	53,400	4,460	3,160	15,100	3,160	2,920	780
29	1,980	3,400	4,750	2,200	-------	38,900	3,910	3,650	10,700	2,690	2,260	780
30	1,720	3,910	3,910	2,000	-------	26,000	3,650	7,430	11,200	2,260	2,070	780
31	1,720	-------	3,650	1,900	-------	20,500	-------	6,350	-------	2,070	6,010	-------

NOTE—*River frozen January 20 to March 14, 1917, inclusive, and discharge is only approximate.

Daily discharge, in second-feet, of Delaware River at Port Jervis, N. Y. for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	685	33,500	2,920	1,200	1,200	14,100	6,700	7,810	7,060	2,070	780	830
2	685	19,200	3,160	1,200	1,100	28,200	7,430	7,060	6,700	1,720	880	880
3	685	13,100	3,160	1,200	1,000	18,600	8,200	6,700	5,360	2,070	780	1,110
4	990	10,300	3,160	1,200	1,000	14,100	9,010	5,680	3,910	1,890	732	935
5	780	8,200	2,920	1,200	1,000	11,600	8,600	5,360	3,910	1,640	780	780
6	780	7,060	2,470	1,000	1,000	11,600	8,200	5,050	3,650	1,240	685	780
7	880	6,010	2,070	1,000	1,000	20,500	6,010	4,750	3,650	1,240	642	685
8	990	5,680	1,720	950	1,200	14,100	5,360	4,460	3,400	1,390	685	642
9	1,110	4,750	1,390	1,200	1,200	11,600	5,050	3,650	3,650	1,550	685	600
10	990	3,910	1,720	1,300	1,200	10,300	9,840	3,400	2,920	1,390	732	525
11	880	3,910	2,070	1,300	1,200	12,100	10,300	3,160	2,470	1,390	732	490
12	780	3,650	2,920	1,400	1,000	9,010	9,010	2,920	2,690	1,470	685	490
13	1,110	3,160	2,690	1,600	1,200	7,810	8,600	4,460	3,160	1,470	780	490
14	3,650	2,920	2,470	1,600	1,600	14,100	8,200	7,430	5,360	1,550	780	562
15	2,470	2,690	2,260	1,700	2,400	15,100	13,100	6,350	4,180	1,720	990	830
16	2,070	2,690	2,000	1,700	3,600	12,100	16,200	5,050	3,650	1,980	990	780
17	1,890	2,690	2,000	1,900	8,500	11,200	14,100	4,460	2,920	1,640	780	685
18	1,890	2,470	1,900	1,500	8,000	15,100	15,100	3,910	2,470	1,550	685	685
19	1,720	2,260	1,700	1,500	7,000	16,200	16,800	3,650	2,260	1,550	562	880
20	1,720	2,260	1,600	1,300	11,600	18,600	13,600	3,650	2,070	1,550	490	1,650
21	4,460	2,070	1,600	1,200	35,000	20,500	11,600	6,010	1,890	1,550	455	1,640
22	3,910	2,070	1,600	1,000	29,000	21,800	19,200	5,360	2,070	1,240	422	2,690
23	3,400	4,460	1,600	1,000	15,100	23,900	21,200	5,360	5,360	1,180	390	2,260
24	2,920	4,180	1,600	1,600	10,700	19,800	16,200	4,750	4,460	990	390	1,896
25	4,460	3,650	1,700	1,500	8,200	15,100	13,600	3,910	3,400	880	390	1,550
26	9,010	3,400	1,600	1,200	8,600	13,100	11,200	3,910	2,920	780	390	1,550
27	7,060	3,160	1,700	1,200	35,000	11,200	9,010	4,460	2,470	780	455	6,700
28	6,010	2,920	1,600	1,100	24,600	9,010	7,810	6,010	2,070	685	390	7,430
29	7,060	2,690	1,500	1,100	-------	7,430	6,700	6,010	1,890	685	455	5,050
30	9,420	2,470	1,400	1,100	-------	7,060	6,350	6,010	1,720	685	455	3,650
31	61,600	-------	1,300	1,100	-------	6,700	-------	8,200	-------	880	455	-------

NOTE—Stage-discharge relation affected by ice December 10, 1917, to February 19, 1918.

Estimated Monthly Discharge of Delaware River at Port Jervis, N. Y.
(Drainage area 3,250 Square Miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	5,360	880	1,980	0.610	0.70
November	3,910	1,390	2,030	0.625	0.70
December	12,100	2,260	4,740	1.46	1.68
January	26,500	1,960	6,380	1.96	2.26
February	7,560	1,000	2,010	0.618	0.64
March	53,400	4,000	16,900	5.20	6.00
April	27,500	3,650	10,400	3.20	3.57
May	8,200	2,690	4,800	1.48	1.71
June	32,700	5,680	10,700	3.29	3.67
July	9,840	2,070	4,790	1.47	1.70
August	4,460	1,290	2,520	0.776	0.89
September	4,460	780	1,480	0.456	0.51
The year	53,400	780	5,750	1.77	24.03

NOTE—River frozen January 20 to March 14, 1917, inclusive, and discharge is only approximate.

Estimated Monthly Discharge of Delaware River at Port Jervis N. Y.
(Drainage area 3,250 Square Miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	61,600	685	4,710	1.45	1.67
November	33,500	2,070	5,720	1.76	1.96
December	3,160	1,300	2,030	0.624	0.72
January	1,900	950	1,290	0.397	0.46
February	35,000	1,000	7,980	2.45	2.55
March	28,200	6,700	14,200	4.38	5.05
April	21,200	5,050	10,700	3.30	3.68
May	8,200	2,920	5,130	1.58	1.82
June	7,060	1,720	3,460	1.06	1.18
July	2,070	685	1,370	0.422	0.49
August	990	390	629	0.194	0.22
September	7,430	490	1,640	0.505	0.56
The year	61,600	390	4,880	1.50	20.36

NOTE—Stage—discharge relation affected by ice December 10, 1917, to February 19, 1918.

DELAWARE BASIN—STATION NO. 4

BUSHKILL CREEK NEAR SHOEMAKERS

DESCRIPTION OF STATION

Location—At single span, steel, through truss, highway bridge two miles upstream from Bushhill, Pike County, and two and one half miles above the mouth.

Records Available—Discharge complete from September 19, 1908, to September 30, 1915, and discharge measurements and gage heights from October 1, 1915, to September 30, 1918.

Drainage Area—115 square miles.

Gage—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge and is read once daily by Walter C. Haywood.

Channel—Both banks are high and not subject to overflow, and the bed is composed of gravel and large rocks.

Remarks—Saw Creek enters from the left a few hundred feet above the station.

Discharge Measurements of Bushkill Creek Near Shoemakers, Monroe County
(Drainage area 115 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft	
16	Feb. 8	Wilson & Brown	146	2.61	180	Under ice cover
17	Feb. 14	Wilson & Brown	119	2.57	123	Partial ice cover
18	Feb. 21	Wilson & Brown	106	2.31	102	Partial ice cover
19	Feb. 28	Wilson & Brown	124	2.69	205	Partial ice cover
20	April 9	Brown	188	2.78	538	0.2 & 0.8 method
21	April 20	Brown	136	2.18	296	0.6 method
22	July 16	Brown & Heagy	104	1.85	165	0.6 method
	1918					
23	Jan. 19	Wilson	115	3.07	141	Under ice cover

Daily Mean Gage Heights, in feet, of Bushkill Creek Near Shoemakers, Monroe County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.55	1.60	2.45	*3.2	2.52	2.42	3.0	1.88	2.03	2.03	1.45	1.34
2	1.50	1.60	2.25	2.95	2.52	2.42	2.99	1.98	2.01	1.98	1.51	1.38
3	1.32	1.55	2.15	2.72	*3.0	2.32	2.84	1.91	2.44	1.92	1.63	1.37
4	1.20	1.55	2.12	2.80	3.1	2.31	2.79	1.88	2.38	1.83	1.48	1.26
5	1.18	1.55	2.11	2.70	2.60	2.28	2.74	2.28	2.32	1.74	1.46	1.26
6	1.15	1.54	2.05	3.0	2.55	2.49	2.70	2.36	2.30	1.70	1.40	1.22
7	1.25	1.55	1.95	2.78	2.70	2.50	2.94	2.28	2.43	1.67	1.43	1.20
8	1.22	1.50	1.92	2.64	2.60	2.35	2.79	2.23	2.42	1.66	1.33	1.28
9	1.20	1.50	1.92	2.51	2.50	2.39	2.76	2.19	2.28	1.53	1.98	1.33
10	1.19	1.48	2.10	2.48	2.63	2.34	2.70	2.17	2.20	2.60	1.88	1.26
11	1.15	1.44	2.08	2.30	3.0	2.31	2.61	2.08	2.28	2.43	1.77	1.24
12	1.15	1.42	2.05	2.80	2.50	2.57	2.49	2.03	3.4	2.43	1.75	1.20
13	1.15	1.42	2.03	3.2	2.95	2.52	2.47	2.00	3.4	2.30	1.58	1.17
14	1.12	1.48	*2.11	3.5	2.62	2.52	2.46	1.98	3.1	2.08	1.43	1.17
15	1.12	1.46	2.15	3.4	2.48	2.45	2.35	1.92	3.0	1.96	1.47	1.15
16	1.18	1.44	2.25	3.2	2.40	2.42	2.31	1.90	2.88	1.86	1.39	1.13
17	1.10	1.43	2.52	3.0	2.32	2.50	2.29	1.96	2.68	1.88	1.38	1.13
18	‡1.08	1.41	2.65	2.95	2.30	2.60	2.26	1.93	2.60	1.94	1.38	1.13
19	1.15	1.40	2.62	2.83	2.28	2.30	2.22	1.89	2.56	1.86	1.32	1.13
20	2.70	1.38	2.40	2.82	2.28	2.15	2.18	1.85	2.48	1.76	1.31	1.13
21	2.52	1.35	2.39	2.80	2.30	2.10	2.17	1.83	2.38	1.73	1.28	1.11
22	2.38	1.52	2.50	2.76	2.28	2.03	2.14	1.82	2.27	1.76	1.27	1.10
23	2.20	1.50	2.55	2.60	2.25	2.18	2.08	1.78	2.23	1.77	1.27	1.10
24	2.00	2.00	2.60	2.55	2.49	2.63	2.04	1.83	2.42	1.83	1.58	1.10
25	1.85	1.95	2.60	2.55	2.57	3.0	2.01	1.78	2.38	1.88	1.53	1.10
26	1.78	1.85	2.60	2.58	2.33	3.0	1.94	1.77	2.34	1.81	1.51	‡1.08
27	1.74	1.82	2.59	2.72	2.40	3.0	1.94	1.76	2.38	1.76	1.40	1.08
28	1.73	1.81	2.53	2.70	2.60	†4.1	1.91	1.82	2.27	1.68	1.38	1.18
29	1.70	1.76	2.70	2.61	-------	3.7	1.89	2.16	2.16	1.57	1.37	1.16
30	1.65	2.35	2.90	2.60	-------	3.4	1.87	2.21	2.10	1.50	1.32	1.16
31	1.63	-------	3.2	2.52	-------	3.0	-------	2.10	-------	1.5	1.30	-------

NOTES—*Creek frozen December 14 to 21, 1916; January 1 and February 3 to March 18, 1917, inclusive. †Maximum 4.1 feet at 8 a. m. ‡Minimum 1.08 feet October 18, 1916, and September 26 and 27, 1917.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.15	2.63	1.88	2.17	2.80	3.6	2.14	2.56	2.20	1.52	1.65	1.40
2	1.13	2.38	1.86	2.18	2.88	3.5	2.10	2.52	2.24	1.50	1.4	1.39
3	1.13	2.26	1.83	2.24	2.88	3.4	2.10	2.40	1.96	1.58	1.35	1.33
4	1.18	2.14	1.70	2.27	2.96	3.2	2.28	2.38	1.91	1.50	1.30	1.27
5	1.15	2.07	1.74	2.29	2.77	3.0	2.14	2.32	1.81	1.49	1.35	1.27
6	1.15	2.00	1.68	2.30	2.74	3.0	2.06	2.20	1.85	1.45	1.34	1.25
7	1.14	1.95	*1.88	2.37	2.72	3.1	2.01	2.19	1.96	1.40	1.31	1.23
8	1.14	1.88	2.03	2.42	2.77	3.0	1.96	2.17	2.11	1.40	1.25	1.24
9	1.22	1.83	2.41	2.46	2.73	2.91	2.10	2.13	1.96	1.38	1.21	1.21
10	1.20	1.78	2.48	2.46	2.71	2.87	2.38	2.06	1.91	1.36	1.19	1.21
11	1.19	1.78	2.36	2.34	2.69	2.77	2.36	1.98	1.94	1.31	1.30	1.18
12	1.28	1.78	2.39	2.82	2.67	2.76	2.32	1.96	2.16	1.31	1.40	1.21
13	1.45	1.76	2.20	2.86	2.80	2.69	2.27	1.94	2.12	1.45	1.98	1.27
14	1.38	1.73	2.27	2.97	2.95	3.1	2.28	2.71	1.96	1.42	1.75	1.45
15	1.32	1.69	2.25	3.1	2.96	3.3	2.68	2.56	1.92	1.35	1.62	1.37
16	1.28	1.69	2.24	3.1	3.1	2.97	3.0	2.41	1.88	1.34	1.50	1.30
17	1.23	1.67	2.24	3.1	3.0	2.89	3.1	2.26	1.78	1.27	1.40	1.25
18	1.21	1.63	2.18	3.0	3.0	2.87	3.4	2.21	1.74	1.30	1.32	1.25
19	1.17	1.62	2.13	3.1	2.89	2.80	3.1	2.14	1.68	1.30	1.92	1.56
20	1.51	1.61	2.08	2.82	3.9	2.89	2.91	2.08	1.65	1.25	1.27	1.56
21	1.53	1.61	2.04	2.97	4.0	2.87	3.0	2.16	1.61	1.25	1.22	1.73
22	1.45	1.76	2.14	2.97	4.0	2.85	†3.6	2.26	1.96	1.20	1.23	1.66
23	1.33	2.00	2.13	2.93	3.7	2.73	3.4	2.24	2.01	1.20	1.21	1.56
24	1.58	1.86	2.09	2.92	3.7	2.57	3.3	2.14	1.91	1.19	1.18	1.52
25	2.08	1.82	2.08	2.92	3.6	2.54	3.1	2.05	1.83	1.19	1.18	1.44
26	1.97	1.93	2.06	2.89	4.5	2.47	2.90	2.05	1.65	1.17	1.18	1.50
27	1.96	1.97	2.05	2.89	4.4	2.39	2.72	2.01	1.61	1.17	1.18	1.83
28	1.93	2.01	2.03	2.89	4.0	2.98	2.64	1.96	1.56	1.15	1.13	1.75
29	1.93	1.88	2.02	2.89	-------	2.18	2.56	1.91	1.56	1.10	1.18	1.68
30	2.11	2.08	2.07	2.82	-------	2.25	2.52	2.41	1.52	‡1.04	1.30	1.61
31	2.83	-------	2.13	2.73	-------	2.20	-------	2.34	-------	1.85	1.23	-------

NOTES—*Gage heights affected by ice December 7, 1917 to March 2, 1918. †Maximum 3.8 feet from hydrograph at 3 a. m. ‡Minimum 1.04 feet.

DELAWARE BASIN—STATION NO. 5

McMICHAELS CREEK NEAR STROUDSBURG

DESCRIPTION OF STATION

Location.—At single span, railroad bridge of Wilkes-Barre and Eastern Railroad near car shops above Stroudsburg, Monroe County.

Records Available.—Discharge complete from August 10, 1911, to September 30, 1915, and discharge measurements and gage heights from October 1, 1915, to September 30, 1918. For other records on this creek see McMichaels Creek at Stroudsburg in the 1910-11 Report of the Water Supply Commission.

Drainage Area.—62 square miles.

Gage.—A chain gage, whose elevation of zero is arbitrary, is located on the downstream side of the bridge and is read twice daily by H. Q. Snyder.

Channel.—Both banks are high and do not overflow, and the bed is composed of stones and mud. The thread of the current passes under the bridge at a slight angle.

Discharge Measurements of McMichaels Creek near Stroudsburg, Monroe County
(Drainage area 62 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
17	Feb. 8	Wilson & Brown	126	3.33	72	Under ice cover
18	Feb. 14	Wilson & Brown	109	3.23	53	Under ice cover
19	Feb. 21	Wilson & Brown	132	3.26	76	Partly under ice cover
20	Feb. 28	Wilson & Brown	150	3.52	115	0.6 method
21	April 10	Brown	184	3.86	211	0.2 & 0.8 method
22	April 20	Brown	153	3.48	126	0.2 & 0.8 method
23	May 15	Brown & Heagy	134	3.16	71	0.2 & 0.8 method
24	July 17	Brown & Heagy	148	3.50	122	0.2 & 0.8 method
	1918					
25	Jan. 18	Wilson	92	3.49	69	Under ice cover

Daily Mean Gage Heights, in feet, of McMichaels Creek near Stroudsburg, Monroe County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	3.13	3.02	3.57	3.57	3.96	3.45	4.2	3.79	††3.22	3.23	3.18	3.22
2	3.12	3.03	3.38	3.51	3.73	3.40	4.0	3.59	††3.38	3.11	3.16	3.20
3	3.07	3.05	3.30	3.73	*3.52	3.35	3.95	3.53	††3.34	3.27	3.24	††3.18
4	3.05	3.09	3.31	3.69	3.30	3.33	3.83	3.59	3.23	3.10	3.04	††3.16
5	3.06	3.07	3.40	4.1	3.55	3.29	3.73	3.63	3.23	3.05	3.08	††3.15
6	3.01	3.11	3.34	4.8	3.49	3.20	4.5	3.59	3.25	3.07	3.04	††3.13
7	3.02	3.08	3.28	4.1	3.51	3.19	4.6	3.57	3.31	3.10	3.06	††3.12
8	3.06	3.06	3.21	3.75	3.41	3.37	4.4	3.53	3.31	3.14	3.11	††3.10
9	3.02	3.04	3.28	3.59	3.31	3.46	4.3	3.44	3.17	3.27	3.45	††3.10
10	2.99	3.06	3.39	3.51	3.24	3.42	3.93	3.37	3.19	3.75	3.28	3.08
11	3.00	3.03	3.37	3.79	3.01	3.35	3.90	3.29	3.25	3.75	3.20	3.02
12	2.97	3.01	3.33	3.74	3.05	3.86	3.77	3.26	4.0	3.77	3.20	3.04
13	3.11	2.99	3.46	3.82	3.07	4.1	3.78	3.24	3.87	3.52	3.06	3.04
14	3.16	2.97	3.41	†6.8	3.22	3.95	3.72	3.19	4.0	3.42	3.15	2.94
15	3.12	2.95	3.42	5.7	3.31	3.86	3.67	3.17	3.89	3.55	3.05	2.96
16	3.09	2.94	3.40	4.3	3.27	3.82	3.62	3.17	3.97	3.39	4.2	2.91
17	3.03	2.92	3.49	4.2	3.31	3.83	3.57	3.19	3.81	3.50	3.58	‡2.90
18	2.99	2.91	*3.39	4.2	3.26	3.91	3.52	3.21	3.73	3.51	3.46	2.96
19	3.83	2.89	3.32	4.1	3.28	3.88	3.46	3.18	3.61	3.44	3.40	2.95
20	4.2	2.86	3.27	4.0	3.23	3.73	3.43	3.16	3.59	3.34	3.26	2.94
21	4.1	2.87	3.21	3.93	3.25	3.57	3.41	3.13	3.55	3.32	3.35	2.99
22	3.89	2.84	4.0	4.4	3.21	3.51	3.37	3.18	3.47	3.32	3.30	2 98
23	3.61	2.97	4.1	4.4	3.31	3.44	3.32	3.20	3.32	3.39	3.32	2.94
24	3.37	3.37	3.85	4.3	4.2	3.40	3.32	3.15	3.57	3.30	3.56	2.98
25	3.23	3.17	3.70	4.2	3.88	3.35	3.28	3.13	3.40	3.30	3.29	2.96
26	3.16	3.09	3.60	4.0	3.65	4.4	3.29	3.13	3.32	3.20	3.22	2 94
27	3.11	3.04	3.56	3.98	3.59	5.0	3.37	3.11	3.83	3.26	3.12	2.94
28	3.06	3.02	3.96	3.97	3.50	4.8	3.32	3.22	††3.61	3.20	3.19	3.03
29	3.05	3.23	3.95	4.2	------	4.7	3.27	3.68	3.57	3.21	3.11	2.94
30	3.04	4.2	3.79	4.2	-------	4.5	3.09	3.29	3.43	3.20	3.16	2.92
31	3.02	-------	3.63	4.2	-------	4.4	-------	3.27	-------	3.16	3.18	-------

NOTES—*Creek frozen December 18 to 22, 1916, and February 3 to 22, 1917, inclusive. ††Estimated †Maximum 7.0 feet at 11:45 a. m. ‡Minimum 2.87 feet at 10:50 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.92	4.0	3.48	-------	3.03	4.5	3.40	3.90	3.53	3.20	††3.5	‖3.02
2	2.90	3.88	3.40	2.99	3.02	4.4	3.40	3.70	3.40	3.09	††3.4	2.99
3	2.92	3.75	3.07	2.99	-------	4.3	3.39	3.64	3.43	3.03	††3.3	3.00
4	2.92	3.61	3.18	2.99	3.04	4.2	3.48	3.66	3.42	3.04	††3.3	3.04
5	2.94	3.52	3.02	3.00	3.06	4.1	3.33	3.56	3.46	2.94	††3.2	3.00
6	2.93	‖3.47	3.14	2.99	3.05	4.2	3.30	4.6	3.46	3.04	3.20	3.02
7	2.88	3.42	3.00	2.99	3.14	4.1	3.32	3.48	3.50	3.02	3.20	3.00
8	2.90	3.40	2.87	3.00	3.16	4.1	3.30	3.45	3.34	3.00	3.17	3.04
9	2.90	3.38	*	2.99	3.15	4.1	3.78	3.44	3.31	2.99	3.18	3.00
10	2.90	3.40	-------	2.99	3.12	4.4	3.82	3.40	3.29	3.00	3.20	2.99
11	2.91	3.30	-------	2.99	3.08	3.92	3.80	3.41	3.43	3.05	3.18	3.00
12	2.94	3.32	-------	3.98	3.14	4.1	3.76	3.40	3.48	2.97	3.18	3.00
13	3.18	3.30	-------	-------	3.34	3.98	3.84	3.42	3.38	3.02	3.18	3.20
14	2.96	3.20	-------	3.47	3.62	5.3	4.1	3.88	3.22	††3.0	3.38	3.08
15	2.96	3.22	-------	-------	4.2	4.8	4.3	3.47	3.19	††2.9	3.20	3.01
16	‡2.82	3.22	-------	3.46	4.3	4.5	4.3	3.46	3.13	††3.0	3.19	3.01
17	2.88	3.24	-------	3.47	3.92	4.4	4.2	3.48	3.16	††2.9	3.18	2.98
18	2.92	3.19	-------	3.50	3.82	4.2	4.3	3.38	3.16	††2.9	3.18	3.13
19	2.92	3.18	-------	3.45	3.62	4.1	4.0	3.36	3.05	††2.9	3.07	3.16
20	3.37	3.18	3.20	-------	†7.7	3.98	3.93	3.36	3.06	††3.0	3.06	3.10
21	2.92	3.21	3.10	3.34	5.5	3.92	4.4	3.56	3.12	††2.9	3.00	3.24
22	2.99	3.20	3.24	3.32	‖5.0	3.86	††4.5	3.63	3.83	††2.8	2.99	‖3.14
23	3.02	3.44	3.12	-------	4.4	3.74	4.4	3.58	3.30	††2.8	3.01	3.05
24	3.23	3.28	3.14	3.32	4.2	3.72	4.3	3.44	3.14	††3.0	3.02	2.98
25	3.46	‖3.12	3.05	3.32	4.2	3.70	4.1	3.48	3.17	††3.3	¶3.01	3.02
26	3.28	2.96	2.92	-------	6.9	3.66	4.0	3.42	3.17	††3.2	3.00	‖3.06
27	3.18	3.07	2.93	-------	5.1	3.62	3.99	3.44	3.06	††2.9	3.00	3.10
28	3.56	3.08	3.00	-------	4.7	3.50	3.95	3.58	‖3.08	††2.8	3.01	3.00
29	3.26	3.08	2.99	-------	-------	3.48	3.80	3.44	3.10	††2.8	3.01	2.87
30	4.9	3.26	-------	3.04	-------	3.44	3.86	3.57	3.12	††3.2	3.04	3.01
31	4.5	-------	3.00	3.02	-------	3.40	-------	3.52	-------	††3.6	3.06	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 19, 1918. ‖Interpolated. ††Estimated. †Maximum 8.8 feet from hydrograph at 11 a. m. ‡Minimum 2.79 feet.

DELAWARE BASIN—STATION NO. 6

POCONO CREEK NEAR STROUDSBURG

DESCRIPTION OF STATION

Location.—At single span, wooden covered, highway bridge known as "Brands Bridge," about two miles above Stroudsburg, Monroe County.

Records Available.—Discharge complete from August 10, 1911, to September 30, 1915, and discharge measurements and gage heights from October 1, 1915, to September 30, 1918.

Drainage Area.—38 square miles.

Gage.—A sectional chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge and is read twice daily by George K. Brands.

Channel.—Both banks are high and seldom overflow, and the bed is composed of small stones and gravel.

Discharge Measurements of Pocono Creek near Stroudsburg, Monroe County
(Drainage area 38 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
14	Feb. 15	Wilson & Brown	18	2.50	43	Part ice cover. Open channel msmt. 50 feet below bridge
15	Feb. 22	Wilson & Brown	16	2.50	41	Part ice cover. Open channel msmt. 50 feet below bridge
16	Feb. 28	Wilson & Brown	45	2.89	110	Wading just below bridge
17	April 10	Brown	67	3.19	152	Wading just below bridge
18	April 20	Brown	42	2.64	83	Wading just below bridge
19	May 15	Brown & Heagy	37	2.49	63	Wading just below bridge
20	May 17	Brown & Heagy	41	2.63	72	Wading just below bridge
	1918					
21	Jan. 18	Wilson	25	3.06	63	Partial ice cover

Daily Mean Gage Heights, in feet, of Pocono Creek near Stroudsburg, Monroe County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916–1917												
1	2.18	2.35	2.81	3.01	2.95	2.81	3.5	2.56	2.72	2.71	2.35	2.41
2	2.17	2.30	2.73	3.01	2.86	2.68	3.4	2.52	2.91	2.69	2.37	2.42
3	2.09	2.29	2.75	2.95	*3.07	2.73	3.2	2.46	2.88	2.67	2.36	2.38
4	2.17	2.27	2.73	2.95	2.94	2.65	3.1	2.53	2.78	2.63	2.35	2.39
5	2.31	2.35	2.74	3.0	2.59	2.51	3.07	3.01	2.71	2.55	2.36	2.41
6	‡2.03	2.31	2.65	3.4	2.87	2.59	3.7	2.89	2.80	2.51	2.33	2.37
7	2.09	2.59	2.59	3.3	2.87	2.45	3.5	2.88	2.77	2.47	2.47	2.39
8	2.05	2.39	2.63	3.2	2.75	2.53	3.4	2.86	2.70	2.43	3.6	2.41
9	2.09	2.36	2.75	3.1	2.75	2.61	3.3	2.72	2.64	2.54	3.2	2.41
10	2.08	2.37	2.71	3.08	2.85	2.59	3.2	2.68	2.63	3.3	2.85	2.31
11	2.09	2.30	2.67	2.94	2.40	2.83	3.2	2.68	2.88	3.4	2.51	2.27
12	2.17	2.32	2.63	2.97	2.48	3.6	3.08	2.61	4.0	3.3	2.57	2.25
13	2.28	2.26	2.68	2.89	2.49	3.2	3.06	2.00	3.5	3.2	2.57	2.25
14	2.25	2.25	*2.73	†5.4	2.49	3.4	2.95	2.56	3.4	2.97	2.51	2.22
15	2.23	2.23	2.76	3.5	2.51	3.1	2.85	2.50	3.4	2.89	2.47	2.21
16	2.17	2.21	2.71	3.5	2.51	3.07	2.79	2.48	3.5	2.82	3.1	2.20
17	2.14	2.23	2.68	3.2	2.48	2.97	2.52	2.62	3.3	2.76	2.86	2.21
18	2.14	2.21	2.69	3.1	2.57	3.05	2.72	2.86	3.02	2.71	2.61	2.16
19	2.37	2.15	2.73	3.01	2.55	2.71	2.79	2.50	2.96	2.57	2.53	2.11
20	3.3	2.29	2.73	2.89	2.57	2.80	2.67	2.52	2.88	2.63	2.50	2.19
21	2.77	2.27	2.77	2.95	2.77	2.77	2.71	2.52	2.86	2.62	2.58	2.16
22	2.61	2.27	4.5	3.2	2.64	2.71	2.63	2.52	2.72	2.63	2.66	2.13
23	2.55	2.38	4.2	3.0	2.58	2.64	2.61	2.55	2.70	2.65	2.99	2.17
24	2.48	2.35	3.2	2.88	3.3	3.6	2.59	2.47	2.64	2.59	2.85	2.17
25	2.45	2.29	2.85	2.92	2.65	3.3	2.53	2.42	2.62	2.55	2.70	2.19
26	2.41	2.29	2.79	2.89	2.83	3.3	2.61	2.32	2.68	2.51	2.55	2.17
27	2.40	2.41	2.77	2.97	3.1	†4.4	2.65	2.46	3.5	2.55	2.56	2.18
28	2.35	2.49	2.79	2.89	2.86	4.4	2.56	2.62	3.00	2.51	2.47	2.19
29	2.37	2.49	2.81	2.98	------	4.0	2.59	3.2	2.96	2.45	2.43	2.17
30	2.35	2.71	2.76	2.98	------	3.7	2.53	2.80	2.82	2.39	2.42	2.13
31	2.39	------	3.00	2.77	------	3.5	------	2.76	------	2.39	2.45	------

NOTES—*Creek frozen December 14 to 22, 1916, and February 3 to 24, 1917, inclusive. †Maximum 5.8 feet at 10:30 a. m., January 14, 1917 (observed) and 5.8 feet at 7 p. m, estimated from hydrograph, March 27, 1917. ‡Minimum 2.00 feet at 4:50 p. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917–1918												
1	2.15	3.2	2.72	2.28	2.61	3.7	2.60	2.97	2.80	2.36	2.81	2.15
2	2.11	3.08	2.61	2.41	2.66	3.6	2.55	2.83	2.79	2.35	2.69	2.18
3	2.15	3.01	2.60	2.44	2.60	3.5	2.53	2.75	2.76	2.29	2.63	2.14
4	2.16	2.95	2.62	2.39	2.60	3.4	2.49	2.80	2.76	2.26	2.59	2.16
5	2.27	2.70	2.62	2.40	2.52	3.3	2.54	2.75	2.70	2.21	2.55	2.16
6	2.22	2.82	2.50	2.39	2.48	3.4	2.49	2.70	2.66	2.21	2.63	2.22
7	2.19	2.73	*2.51	2.43	2.66	3.3	2.51	2.66	2.66	2.19	2.79	2.18
8	2.15	2.67	2.55	2.52	2.70	3.4	2.45	2.58	2.65	2.16	2.62	2.20
9	2.15	2.64	2.65	2.48	2.74	3.3	3.1	2.56	2.54	2.17	2.53	2.12
10	2.13	2.63	2.51	2.52	2.74	3.6	3.2	2.59	2.50	2.13	2.47	2.16
11	2.16	2.60	2.56	2.43	2.78	3.2	2.84	2.59	2.61	2.15	2.39	2.19
12	2.39	2.58	2.58	2.29	2.77	3.2	2.87	2.49	2.70	2.16	2.49	2.28
13	2.39	2.56	2.53	2.47	3.3	3.4	2.99	2.54	2.66	2.23	2.49	2.52
14	2.29	2.53	2.53	3.2	3.4	4.1	3.2	2.48	2.58	2.29	2.45	2.44
15	2.25	2.53	2.63	3.05	3.6	4.0	3.3	2.86	2.53	2.27	2.63	2.28
16	‡2.09	2.53	2.57	3.02	3.9	3.8	3.5	2.78	2.48	2.25	2.59	2.23
17	2.15	2.49	2.71	3.2	3.8	3.7	3.6	2.69	2.42	2.21	2.56	2.18
18	2.17	2.47	2.69	3.2	3.7	3.5	3.6	2.65	2.40	2.23	2.51	2.18
19	2.14	2.43	2.74	3.08	3.8	3.3	3.4	2.59	2.35	2.27	2.49	2.22
20	2.19	2.42	2.67	2.91	5.7	3.3	3.4	2.66	2.30	2.25	2.33	2.49
21	2.23	2.55	2.61	2.88	5.5	3.3	4.1	2.88	2.29	2.15	2.31	2.66
22	2.31	2.61	2.57	2.96	4.4	3.3	4.0	3.1	3.2	2.15	2.27	2.44
23	2.33	2.59	2.61	2.91	4.3	2.97	3.9	3.03	2.66	2.16	2.22	2.40
24	2.87	2.65	2.53	2.82	4.0	2.91	3.8	2.83	2.52	2.38	2.21	2.36
25	3.1	2.53	2.31	2.80	3.9	2.91	3.7	2.80	2.45	2.65	2.25	2.35
26	2.85	2.40	2.31	2.80	†6.4	2.79	3.4	2.78	2.42	2.47	2.23	2.42
27	2.75	2.36	2.33	2.70	4.2	2.75	3.1	2.74	2.38	2.21	2.16	2.54
28	3.05	2.45	2.31	2.61	3.9	2.74	3.01	2.82	2.38	2.15	2.17	2.46
29	2.93	2.39	2.27	2.79	------	2.69	2.94	3.2	2.34	2.13	2.29	2.38
30	4.2	2.41	2.35	2.69	------	2.64	2.97	2.99	2.30	2.75	2.27	2.34
31	3.6	------	2.33	2.62	------	2.62	------	2.86	------	3.4	2.20	------

NOTES—*Gage heights affected by ice December 7, 1917 to February 25, 1918. †Maximum 7.1 feet from hydrograph at 10 a. m. ‡Minimum 2.07 feet.

DELAWARE BASIN—STATION NO. 7

LEHIGH RIVER AT TANNERY

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge at Tannery, Carbon County.

Records Available.—Discharge measurements and gage heights from June 23, 1914, to September 30, 1918. For other records on this river see Lehigh River at Bethlehem.

Drainage Area.—335 square miles.

Gage.—A standard chain gage, whose elevation of zero is 1,029.41 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by G. D. Heimbach.

Channel.—Both banks are high and not subject to overflow, and the bed is composed of large stones and gravel.

Discharge Measurements of Lehigh River at Tannery, Carbon County
(Drainage area 335 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq.ft.	Feet	Sec.-ft.	
12	April 14	Brown,	236	4.45	1,016	0.6 method.
13	April 25	Brown,	190	3.80	594	0.6 method.
14	May 16	Brown & Heagy,	184	3.62	468	0.6 method.
15	July 7	Brown & Heagy,	173	3.56	395	0.6 method.

Daily Mean Gage Heights, in feet, of Lehigh River at Tannery, Carbon County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	3.1	2.6	3.6	3.2	4.2	4.0	6.3	3.6	4.6	4.5	3.3	3.5
2	3.0	2.6	3.6	3.1	4.2	4.0	6.2	3.6	5.1	4.3	3.3	3.4
3	3.0	‡2.5	3.4	3.1	4.1	3.9	6.1	3.6	5.3	4.2	3.3	3.4
4	3.0	2.7	3.4	3.2	4.1	4.0	6.0	3.6	4.8	4.0	3.2	3.3
5	3.0	3.0	3.3	3.6	4.0	3.9	5.9	4.0	4.6	3.8	3.1	3.2
6	2.9	3.2	3.2	3.9	3.9	3.9	5.7	4.2	5.2	3.8	3.1	3.2
7	2.9	3.4	3.2	4.1	3.9	3.8	5.5	4.2	5.6	3.6	3.6	3.2
8	2.9	3.3	3.3	4.2	3.9	3.7	5.5	4.4	5.1	3.6	4.8	3.3
9	2.8	3.2	3.4	4.1	3.8	3.6	5.4	4.4	4.7	3.9	7.4	3.3
10	2.8	3.2	3.5	4.1	3.8	3.6	5.3	4.4	4.3	4.0	6.2	3.3
11	2.8	3.1	3.4	4.0	3.8	3.7	5.2	4.3	4.5	4.1	5.4	3.2
12	2.8	3.2	3.3	4.3	3.7	3.9	5.1	4.1	5.7	4.1	4.8	3.2
13	3.0	3.2	3.4	4.3	3.7	4.0	4.5	4.0	5.5	4.0	4.4	3.1
14	3.4	3.1	3.4	4.4	3.7	3.9	4.1	3.9	5.6	3.9	4.3	3.1
15	3.4	3.1	3.3	4.4	3.7	3.8	3.9	3.8	5.7	3.8	4.1	3.0
16	3.3	3.3	3.2	4.3	3.7	3.7	3.9	3.7	5.7	3.7	6.0	3.0
17	3.2	3.2	3.1	4.3	3.7	3.7	3.9	3.8	5.3	3.6	5.0	3.0
18	3.1	3.2	3.1	4.2	3.6	3.7	3.8	3.7	4.9	3.6	4.4	3.0
19	3.2	3.1	3.1	4.1	3.6	3.8	3.7	3.6	4.6	3.5	4.2	3.0
20	3.7	3.0	3.0	4.1	3.5	3.9	3.6	3.4	4.5	3.5	4.1	3.0
21	4.2	3.0	3.0	4.3	3.5	4.0	3.5	3.4	4.4	3.5	3.8	2.9
22	4.2	2.9	3.0	4.5	3.4	4.1	3.5	3.4	4.4	3.4	3.8	2.9
23	4.1	3.0	2.9	4.3	3.4	4.2	3.4	3.4	4.2	3.5	3.7	2.9
24	4.1	3.4	2.9	4.2	3.3	4.2	3.7	3.4	5.0	3.6	4.2	2.9
25	3.5	3.6	2.8	4.2	3.4	4.2	3.8	3.4	4.8	3.4	4.4	2.9
26	2.9	3.5	2.8	4.1	3.5	4.2	3.8	3.3	4.5	3.4	4.0	2.9
27	2.9	3.4	3.0	4.1	3.7	4.6	3.9	3.2	5.6	3.5	3.8	3.0
28	2.8	3.3	3.2	4.2	4.1	†7.5	3.8	3.4	5.1	3.4	3.6	3.0
29	2.8	3.4	3.4	4.2	-------	6.7	3.7	5.2	4.9	3.3	3.4	3.0
30	2.7	3.5	3.4	4.3	-------	6.5	3.6	4.8	4.7	3.3	3.7	2.9
31	2.6	-------	3.4	4.3	-------	6.4	-------	4.5	-------	3.3	3.6	-------

NOTES—†Maximum 7.9 feet at 4 a. m. estimated from hydrograph. ‡Minimum 2.5 feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.9	6.1	3.5	4.9	4.7	5.6	3.9	4.6	4.4	3.1	3.8	3.4
2	2.8	5.8	3.5	5.0	4.6	5.6	3.8	4.5	4.0	3.0	3.5	3.3
3	2.8	5.5	3.4	5.0	4.6	5.2	3.9	4.5	3.8	2.9	3.5	3.1
4	2.9	4.8	3.4	5.0	4.6	4.9	4.1	4.5	3.6	3.1	3.2	3.0
5	2.9	4.6	3.4	5.2	4.5	4.8	4.0	4.4	3.6	3.1	3.3	2.9
6	2.9	4.5	3.3	5.2	4.6	4.8	3.8	4.3	3.5	3.0	3.2	3.1
7	2.9	4.4	3.3	5.3	4.6	4.8	3.7	4.1	3.7	2.9	3.1	3.1
8	2.9	4.3	3.3	5.3	4.5	4.8	3.8	4.0	3.7	3.0	3.1	3.0
9	2.9	4.1	*3.5	5.0	4.5	4.7	4.3	4.0	3.5	3.0	3.0	2.9
10	2.8	4.0	4.1	5.0	4.4	4.7	4.6	3.9	3.4	2.9	3.0	2.9
11	2.8	4.0	5.0	4.8	4.4	4.6	4.5	3.8	3.5	2.9	3.0	2.8
12	2.9	3.8	5.0	4.6	4.4	4.5	4.4	3.7	3.8	2.8	3.2	2.8
13	3.6	3.7	5.5	4.6	4.5	4.5	4.4	3.8	3.9	2.8	3.1	2.8
14	3.3	3.6	5.6	4.6	4.7	5.8	4.4	4.5	3.8	2.8	4.0	2.8
15	3.2	3.5	5.6	4.7	5.5	6.1	4.9	4.3	3.7	3.0	3.7	2.8
16	3.1	3.5	5.6	4.7	5.6	5.6	5.9	4.1	3.6	3.0	3.4	2.8
17	3.1	3.4	5.6	4.7	5.6	5.2	6.7	4.0	3.5	3.0	3.1	2.8
18	3.1	3.4	5.3	4.7	5.4	5.1	7.2	3.9	3.4	3.0	2.9	2.9
19	3.1	3.4	5.0	4.8	5.4	5.1	6.5	3.7	3.3	2.9	3.0	3.0
20	4.0	3.4	4.6	4.8	6.6	5.0	6.1	3.7	3.2	2.8	2.9	3.2
21	4.1	3.5	4.1	4.8	6.4	5.0	6.1	4.1	3.1	2.6	2.8	4.2
22	3.9	3.6	4.0	4.8	6.2	4.8	6.6	4.0	3.8	2.9	2.8	3.9
23	3.7	4.0	4.0	4.8	5.6	4.7	6.2	4.0	4.0	2.8	2.7	3.6
24	4.2	3.9	4.0	4.8	5.0	4.6	5.9	3.8	3.8	2.7	2.7	3.4
25	5.4	3.8	3.9	4.8	5.0	4.6	5.6	3.6	3.6	3.1	‡2.6	3.2
26	4.8	3.7	3.7	4.8	6.8	4.5	5.4	3.6	3.4	3.0	2.7	3.3
27	4.6	3.6	3.6	4.8	6.6	4.4	5.1	3.5	3.2	2.9	2.7	3.8
28	4.8	3.5	3.6	4.8	6.1	4.2	4.8	4.1	3.2	2.9	2.7	3.6
29	4.7	3.5	3.5	4.7	-------	4.1	4.7	4.2	3.1	2.9	2.7	3.5
30	†7.4	3.4	3.6	4.7	-------	4.0	4.6	4.5	3.1	3.2	2.7	3.4
31	7.2	-------	3.6	4.7	-------	3.9	-------	5.4	-------	4.2	2.7	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 20, 1918. †Maximum 9.0 feet from hydrograph at 8 p. m. ‡Minimum 2.53 feet.

DELAWARE BASIN—STATION NO. 8

LEHIGH RIVER AT BETHLEHEM

DESCRIPTION OF STATION

Location.—At nine span, steel, through truss, highway bridge with three spans over the normal river channel at New Street, Bethlehem, Northampton County.

Records Available.—Discharge complete from September 22, 1902, to February 13, 1905, and from April 26, 1909, to September 30, 1918. For other records on this river see Lehigh River at Tannery.

Drainage Area.—1,235 square miles.

Gage.—A standard chain gage, whose elevation of zero is 210.64 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by John E. Santee.

Channel.—The right bank is high and does not overflow; the left is low and overflows at high stages, and the bed is composed of sand and gravel.

Remarks.—The Lehigh Canal follows the left bank and passes over Monocacy Creek and under the left span of the bridge. Monocacy Creek passes under the canal on the left bank and under the bridge, entering the river a short distance below.

Discharge Measurements of Lehigh River at Bethlehem, Northampton County
(Drainage area 1,235 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
52	July 17	Brown and Heagy	1186	3.28	2511	0.6 method. 296 sec.-ft. in canal.
53	Aug. 31	Boehringer and Wilson	940	2.76	1428	0.2 & 0.8 method. 215 sec-ft. in canal.
54	Oct. 10	Boehringer	652	1.77	457	0.2 & 0.8 method.
	1918					
55	Sept. 30	Reckord and Shade	714	2.01	623	0.2 & 0.8 method.

Daily Mean Gage Heights, in feet, of Lehigh River at Bethlehem, Northampton County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.89	1.91	3.0	2.6	3.3	3.1	4.6	2.7	3.0	3.3	2.4	2.7
2	1.85	1.88	2.7	2.8	3.5	2.8	4.4	2.7	3.3	3.0	2.7	2.7
3	1.78	1.91	2.5	2.7	2.8	2.7	4.3	2.6	3.8	2.9	2.5	2.8
4	1.76	1.87	2.5	2.9	2.7	2.7	4.1	2.5	3.5	2.9	2.2	2.5
5	1.76	1.82	2.4	3.3	2.7	2.7	4.1	2.8	3.3	2.8	2.2	2.4
6	1.78	1.84	2.4	4.8	2.6	2.7	4.8	3.0	3.4	2.7	2.2	2.3
7	1.78	1.89	2.3	4.4	2.6	2.4	4.8	2.9	3.6	2.6	2.3	2.4
8	1.76	1.83	2.2	4.0	2.6	2.7	4.5	2.9	3.8	2.6	2.6	2.4
9	1.76	1.78	2.2	3.7	2.6	3.2	4.3	2.9	3.4	2.6	5.7	2.7
10	1.75	1.80	2.5	3.5	2.2	3.6	4.1	2.9	3.3	2.7	5.3	2.5
11	1.75	1.83	2.4	3.4	2.3	4.0	3.8	2.9	3.5	4.0	4.3	2.4
12	1.73	1.71	2.3	3.3	2.4	5.6	3.7	2.8	5.0	3.9	3.9	2.3
13	1.71	1.76	2.4	3.0	2.4	4.4	3.7	2.7	4.6	3.7	3.4	2.2
14	1.77	1.78	2.2	5.5	2.2	3.6	3.6	2.7	4.3	3.4	3.2	2.15
15	1.77	1.79	2.10	6.5	2.2	3.5	3.5	2.6	4.7	4.5	3.1	2.2
16	1.83	1.79	2.01	4.6	2.3	3.6	3.4	2.6	5.2	3.7	3.1	2.10
17	1.75	1.80	1.98	4.1	2.3	3.7	3.2	2.5	4.8	3.3	4.2	2.09
18	‡1.65	1.75	2.05	3.9	2.3	4.0	3.2	2.6	4.3	3.4	3.5	2.05
19	2.3	1.68	2.09	3.6	2.4	3.5	3.1	2.5	3.9	3.1	3.2	2.02
20	3.1	1.75	2.03	3.2	2.4	3.3	3.1	2.4	3.8	2.9	3.0	2.00
21	2.8	1.69	2.3	3.3	2.5	3.2	3.1	2.4	4.4	2.8	2.9	1.91
22	2.7	1.70	2.7	4.2	2.5	3.2	3.0	2.4	3.8	2.6	2.9	1.96
23	2.5	1.73	3.2	4.0	2.4	3.3	3.0	2.4	3.5	2.10	2.8	1.85
24	2.2	2.3	3.2	3.3	3.7	3.7	2.9	2.4	3.5	2.7	3.5	1.91
25	2.10	2.3	3.0	3.2	3.4	5.0	2.9	2.3	3.8	2.8	3.3	1.87
26	2.00	1.99	2.9	2.9	2.9	4.6	2.8	2.2	3.5	2.7	3.0	1.81
27	1.93	1.92	2.9	2.8	3.0	5.0	2.8	2.2	3.5	2.6	2.8	1.80
28	1.93	1.94	3.0	2.8	3.4	†8.4	2.8	2.4	3.8	2.6	2.7	1.82
29	1.78	1.98	3.2	2.9	-------	6.8	2.7	3.2	3.6	2.5	2.5	1.82
30	1.90	2.3	2.8	3.7	-------	5.4	2.7	3.4	3.6	2.5	2.7	1.90
31	1.90	-------	2.7	3.5	-------	4.9	-------	3.1	-------	2.4	2.8	-------

NOTES—†Maximum 9.5 feet at 3 a. m. estimated from hydrograph. ‡Minimum 1.60 feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.93	5.6	2.6	2.4	2.08	5.5	3.0	3.8	3.7	2.5	2.7	1.70
2	1.83	4.7	2.4	2.7	2.02	5.0	3.0	3.7	3.2	2.4	2.3	1.90
3	1.82	4.3	2.5	2.8	2.03	4.8	2.9	3.6	3.0	2.2	2.17	1.99
4	1.89	3.9	2.4	2.6	2.13	4.5	3.2	3.5	2.8	2.09	2.05	1.89
5	1.86	3.7	2.4	2.5	2.5	4.4	3.0	3.4	2.7	2.07	2.03	1.83
6	1.82	3.6	2.3	2.3	2.5	4.4	2.9	3.4	2.8	2.09	2.09	1.80
7	1.75	3.4	2.3	2.3	2.19	4.6	2.8	3.2	2.8	2.07	2.01	1.98
8	1.83	3.2	2.16	2.2	2.08	4.5	2.7	3.1	2.9	2.09	1.92	1.88
9	1.80	3.1	2.12	2.06	2.02	4.3	3.2	3.0	2.7	2.03	1.90	1.84
10	1.80	3.0	2.6	2.03	1.90	4.3	4.4	3.0	2.5	1.97	1.80	1.81
11	1.80	2.9	3.0	2.07	2.02	4.2	4.6	3.0	2.7	2.00	1.79	1.78
12	1.83	2.9	2.8	3.4	2.19	4.2	4.6	2.9	2.7	2.00	1.85	1.71
13	2.4	2.8	2.3	3.4	*2.7	4.1	4.5	2.9	3.0	2.02	2.5	1.71
14	2.2	2.7	2.3	3.0	3.7	5.3	4.8	3.6	2.8	2.2	3.0	1.69
15	2.06	2.7	2.5	2.9	4.4	6.2	5.5	3.4	2.8	2.19	2.7	1.74
16	2.02	2.6	2.5	2.6	5.1	5.3	5.8	3.1	2.6	2.07	2.4	1.73
17	1.96	2.5	2.4	2.5	4.1	4.9	5.8	3.0	2.5	1.99	2.16	1.71
18	1.88	2.4	2.3	2.4	3.5	4.6	6.0	2.9	2.4	2.01	1.98	1.82
19	1.89	2.5	2.3	2.4	3.8	4.4	5.6	2.9	2.4	1.94	1.95	1.93
20	2.4	2.5	2.2	2.5	10.5	4.3	5.1	2.8	2.3	1.91	1.89	2.09
21	2.6	2.4	2.17	2.7	7.5	4.1	5.3	2.9	2.3	1.89	1.85	2.4
22	2.5	2.5	2.15	2.5	6.3	4.0	6.3	3.2	2.8	1.92	1.88	2.7
23	2.3	2.9	2.02	2.7	4.9	3.9	5.9	3.1	3.1	1.83	1.80	2.3
24	2.5	2.8	2.10	2.4	4.6	3.7	5.4	3.0	2.8	1.70	1.76	2.16
25	3.6	2.6	2.14	2.2	4.8	3.6	4.9	3.0	2.6	1.90	1.72	2.02
26	3.5	2.3	2.14	2.7	†9.3	3.4	4.6	2.8	2.5	1.92	1.76	2.01
27	3.2	2.02	2.06	2.7	• 6.8	3.3	4.3	3.0	2.4	1.92	1.64	2.07
28	3.2	2.2	1.95	2.8	6.0	3.2	4.1	5.4	2.4	1.86	1.69	2.3
29	3.4	2.3	1.88	2.9	-------	3.1	4.0	4.0	2.3	1.81	‡1.62	2.14
30	5.5	2.4	*2.09	2.3	-------	3.0	3.9	3.6	2.3	2.07	1.77	2.01
31	7.2	-------	2.3	2.0	-------	3.0	-------	3.9	-------	3.3	1.74	-------

NOTES—*Gage heights affected by ice December 30, 1917, to January 12, 1918; February 13 to 23. †Maximum 11.0 feet from hydrograph at 6 p. m. ‡Minimum 1.60 feet.

Daily discharge, in second-feet, of Lehigh River at Bethlehem, Northampton County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	602	619	1,860	1,280	2,260	1,950	4,720	1,440	1,860	2,300	1,100	1,440
2	568	593	1,440	1,530	2,580	1,530	4,280	1,440	2,300	1,860	1,440	1,440
3	509	619	1,220	1,400	1,530	1,400	4,070	1,320	3,140	1,720	1,220	1,580
4	493	584	1,220	1,670	1,400	1,400	3,670	1,220	2,620	1,720	895	1,220
5	493	542	1,100	2,260	1,400	1,400	3,670	1,580	2,300	1,580	895	1,100
6	509	559	1,100	5,170	1,280	1,400	5,170	1,860	2,400	1,410	895	995
7	509	576	995	4,280	1,280	1,066	5,170	1,720	2,800	1,320	995	1,100
8	493	550	895	3,470	1,280	1,400	4,500	1,720	3,140	1,320	1,320	1,100
9	493	509	895	2,920	1,280	2,100	4,070	1,720	2,460	1,320	7,420	1,440
10	485	525	1,220	2,580	850	2,750	3,670	1,720	2,300	1,440	6,420	1,220
11	485	550	1,100	2,420	950	3,470	3,100	1,720	2,620	3,520	4,120	1,100
12	469	453	995	2,260	1,000	7,130	2,920	1,580	5,680	3,320	3,320	995
13	453	493	1,060	1,810	1,060	4,280	2,920	1,440	4,760	2,960	2,460	895
14	501	509	850	6,880	850	2,750	2,750	1,440	4,120	2,460	2,140	845
15	501	517	750	9,420	850	2,580	2,580	1,320	4,980	4,510	2,000	915
16	550	517	664	4,720	950	2,750	2,460	1,320	6,180	2,960	2,000	795
17	485	525	637	3,670	950	2,920	2,140	1,220	5,220	2,300	3,920	783
18	‡408	485	702	3,280	950	3,470	2,140	1,320	4,120	2,460	2,620	748
19	995	430	740	2,750	1,060	2,580	2,000	1,220	3,320	2,000	2,140	719
20	2,000	485	684	2,100	1,060	2,260	2,000	1,100	3,140	1,720	1,860	700
21	1,580	438	950	2,260	1,170	2,100	2,000	1,100	4,320	1,580	1,720	619
22	1,440	445	1,400	3,870	1,170	2,100	1,860	1,100	3,140	1,320	1,720	664
23	1,220	469	2,100	3,470	1,060	2,260	1,860	1,100	2,620	795	1,580	568
24	895	995	2,100	2,260	2,920	2,920	1,720	1,100	2,620	1,440	2,620	619
25	795	995	1,810	2,100	2,420	5,640	1,720	995	3,140	1,580	2,300	584
26	700	691	1,670	1,670	1,670	4,720	1,580	895	2,620	1,440	1,860	534
27	637	628	1,670	1,530	1,810	5,640	1,580	895	2,620	1,320	1,580	525
28	637	646	1,810	1,530	2,420	†14,700	1,580	1,100	3,140	1,320	1,440	542
29	509	682	2,100	1,670	-------	10,200	1,440	2,140	2,800	1,220	1,220	542
30	610	995	1,530	2,920	-------	6,030	1,440	2,460	2,800	1,220	1,440	610
31	610	-------	1,400	2,580	-------	5,400	-------	2,000	-------	1,100	1,580	-------

NOTES—October 1 to December 12, 1916, and April 16 to September 30, 1917, inclusive, 45 second-feet added to daily discharge for canal. †Maximum = 17,900 second-feet. ‡Minimum = 370 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	645	7,260	1,370	440	750	6,950	1,920	3,320	3,140	1,280	1,540	445
2	552	5,100	1,120	400	690	5,730	1,920	3,140	2,280	1,160	1,010	615
3	543	4,280	1,240	400	700	5,280	1,770	2,960	1,960	925	892	705
4	606	3,500	1,120	360	803	4,640	2,230	2,780	1,680	805	765	606
5	579	3,140	1,120	360	1,240	4,440	1,920	2,620	1,540	875	745	659
6	543	2,960	995	320	1,240	4,440	1,770	2,620	1,680	805	805	525
7	485	2,620	995	320	869	4,850	1,630	2,280	1,680	785	725	695
8	552	2,280	836	320	750	4,640	1,500	2,120	1,820	805	635	597
9	525	2,120	792	320	690	4,240	2,230	1,960	1,540	745	615	561
10	525	1,960	1,370	250	570	4,240	4,440	1,960	1,280	685	525	534
11	525	1,820	1,920	320	690	4,040	4,850	1,960	1,540	775	517	509
12	552	1,820	1,630	1,920	869	4,040	4,850	1,820	1,540	715	570	453
13	1,160	1,680	995	2,570	*1,240	3,840	4,640	1,820	1,960	735	1,280	453
14	925	1,540	995	1,920	1,920	6,450	5,280	2,960	1,680	925	1,960	437
15	775	1,540	1,240	1,770	2,400	8,830	7,000	2,620	1,680	914	1,540	477
16	735	1,420	1,240	1,370	2,570	6,450	7,780	2,120	1,240	785	1,160	469
17	675	1,280	1,120	1,240	2,740	5,500	7,780	1,960	1,280	705	881	458
18	597	1,160	995	1,120	2,740	4,850	8,320	1,820	1,160	725	695	543
19	606	1,280	995	1,120	3,090	4,440	7,260	1,820	1,160	655	665	645
20	1,160	1,280	880	1,240	3,270	4,240	6,020	1,680	1,040	625	606	805
21	1,420	1,160	847	1,500	3,640	3,840	6,500	1,820	1,040	606	570	1,160
22	1,280	1,280	825	1,240	4,040	3,640	9,160	2,280	1,680	635	597	1,540
23	1,040	1,820	690	1,500	4,440	3,450	8,040	2,120	2,120	552	525	1,040
24	1,280	1,680	770	1,120	4,850	3,090	6,740	1,960	1,680	445	493	881
25	2,960	1,420	814	880	5,280	2,910	5,540	1,960	1,420	615	461	735
26	2,780	1,040	814	847	†17,600	2,570	4,900	1,680	1,280	635	493	725
27	2,280	735	730	847	10,500	2,400	4,280	1,960	1,160	635	397	785
28	2,280	925	620	1,630	8,270	2,220	3,880	6,740	1,160	579	437	1,040
29	2,620	995	552	1,770	-------	2,070	3,680	3,680	1,040	534	‡381	859
30	7,000	1,120	*525	995	-------	1,920	3,500	2,960	1,040	785	501	725
31	11,700	-------	*480	770	-------	1,920	-------	3,500	-------	2,400	477	-------

NOTES—*Gage heights affected by ice December 30, 1917, to January 12, 1918, February 13 to 23, and discharge estimated from climatological records. †Maximum 22,700 second-feet from hydrograph at 6 p. m. ‡Minimum 320 second-feet.

Estimated Monthly Discharge of Lehigh River at Bethlehem, Northampton County
(Drainage area 1,235 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	2,000	‡408	698	0.57	0.66
November	995	430	587	0.48	0.54
December	2,100	637	1,250	1.01	1.16
January	9,420	1,280	2,960	2.40	2.77
February	2,920	850	1,410	1.14	1.19
March	†14,700	1,060	3,640	2.95	3.40
April	5,170	1,440	2,830	2.29	2.56
May	2,460	895	1,430	1.16	1.34
June	6,180	1,860	3,310	2.68	2.99
July	4,540	795	1,890	1.53	1.76
August	7,420	895	2,200	1.78	2.05
September	1,580	525	898	0.73	0.81
The year	14,700	408	1,930	1.56	21.20

NOTES—October 1 to December 12, 1916, and April 16 to September 30, 1917, inclusive, 45 second-feet added to daily discharge for canal. †Maximum 17,900 second-feet March 28, 1917. ‡Minimum 370 second-feet October 18, 1916.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	11,700	485	1,610	1.30	1.50
November	7,260	735	2,070	1.68	1.87
December	1,920	----------	988	0.80	0.92
January	2,570	----------	1,010	0.82	0.94
February	17,600	570	3,160	2.56	2.67
March	8,830	1,920	4,260	3.45	3.98
April	9,160	1,500	4,710	3.81	4.25
May,	6,740	1,680	2,480	2.01	2.32
June	3,140	1,040	1 550	1.26	1.41
July	2,400	445	799	0.65	0.75
August	1,960	381	758	0.61	0.70
September,	1,540	437	686	0.56	0.62
The Year	17,600	381	2,000	1.62	21.93

NOTE—*Gage heights affected by ice December 30, 1917, to January 12, 1918, February 13 to 23, and discharge estimated from climatological records. Maximum 22,700 second-feet February 26. Minimum 320 second-feet August 29.

DELAWARE BASIN—STATION NO. 9

DELAWARE RIVER AT RIEGELSVILLE

DESCRIPTION OF STATION

Location.—At three span, steel, suspension, highway bridge between Riegelsville, Pa., and Riegelsville, N. J.

Records Available.— Discharge complete from July 3, 1906, to September 30, 1918. For other records on this river see Delaware

River at Port Jervis, N. Y.; also Delaware River at Lambertville, N. J. in the 1910-11 Report of the Water Supply Commission.

Drainage Area.—6,430 square miles.

Gage.—An inclined and vertical staff gage, whose elevation of zero is arbitrary, is located on the left bank under the upstream side of the bridge. A standard chain gage on the same datum is attached to the upstream handrail on the middle span of the bridge, and readings are sometimes taken with this gage during ice or flood conditions. Gage heights are observed twice daily by H. T. Bernholz.

Channel:—Both banks are high and not subject to overflow and the bed is composed of gravel and boulders.

Remarks.—The Delaware Division Canal runs along the Pennsylvania shore about 200 feet from the river and is measured at the highway bridge a short distance above the river bridge. The following data have been furnished by the U. S. Geological Survey.

Discharge Measurements of Delaware River at Riegelsville.
(Drainage area 6,430 square miles)

No.	Date	Hydrographer	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
25	Sept. 14	Jackson	3,380	2.80	2,890	230 sec.-ft. in canal

Daily Mean Gage Heights, in feet, of Delaware River at Riegelsville, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	2.8	2.95	5.4	4.2	4.8	5.0	9.5	4.3	5.4	6.5	3.4	4.6
2	2.9	3.0	6.8	4.2	4.8	5.3	10.5	4.4	5.3	5.8	3.6	4.2
3	3.0	3.0	5.6	4.2	3.8	5.6	12.5	4.7	6.0	5.5	3.8	4.0
4	2.9	2.9	5.2	4.4	3.7	5.0	11.7	4.5	5.7	5.6	3.2	3.7
5	2.8	2.95	4.8	4.8	4.1	4.6	9.8	4.7	5.5	5.1	3.0	3.5
6	2.7	2.95	4.6	6.9	3.4	4.0	9.9	5.4	5.3	4.6	3.0	3.3
7	2.6	2.9	4.4	6.7	3.7	4.0	9.7	6.2	5.6	4.4	3.0	3.2
8	2.6	2.9	4.2	7.0	3.7	4.3	9.5	6.1	6.3	4.2	3.2	3.3
9	2.65	3.0	4.0	6.4	3.8	4.8	8.4	6.0	7.3	4.2	5.1	4.3
10	2.45	2.9	4.2	6.0	3.2	5.0	8.0	6.2	6.8	4.7	5.5	3.2
11	2.4	2.85	4.2	5.7	3.4	5.6	7.4	6.0	7.0	5.1	5.0	3.1
12	2.4	2.8	4.2	4.4	3.2	7.6	6.9	5.7	9.4	6.0	4.7	3.0
13	2.35	3.0	4.2	4.2	3.2	6.8	6.7	5.3	12.4	6.5	4.6	2.95
14	2.35	3.0	3.8	6.4	3.3	6.8	6.6	5.1	9.7	5.9	4.3	2.9
15	2.4	2.9	3.7	8.1	3.3	7.2	6.3	5.0	9.2	6.1	3.9	2.8
16	2.35	2.8	3.3	8.4	3.5	6.7	6.0	4.7	9.4	5.7	4.3	2.7
17	2.4	2.85	3.1	7.8	3.2	6.6	5.7	4.5	8.3	5.3	4.5	2.6
18	2.45	2.9	3.0	6.6	3.2	7.9	5.4	4.5	7.5	5.6	4.0	2.65
19	2.55	2.75	3.2	6.2	3.4	6.2	5.3	4.4	6.7	4.8	3.8	2.5
20	3.6	2.75	3.1	5.5	3.4	5.7	5.5	4.2	6.3	4.5	3.7	2.55
21	5.1	2.75	3.3	5.2	3.4	5.5	5.5	4.1	6.5	4.3	3.5	2.5
22	4.4	2.7	3.7	5.9	3.5	5.4	6.0	4.0	6.2	4.2	3.5	2.5
23	4.7	2.7	4.8	5.9	3.2	5.6	5.9	3.8	5.7	4.4	3.3	2.3
24	4.2	3.1	5.4	5.1	5.2	6.6	5.5	3.9	5.4	4.3	3.9	2.35
25	3.8	3.7	5.8	5.0	4.7	12.2	5.3	3.8	5.9	4.2	3.8	2.3
26	3.6	4.2	5.4	4.4	4.0	13.7	5.0	3.8	5.6	4.2	5.1	2.3
27	3.4	4.1	5.1	4.1	4.0	14.0	4.8	3.7	5.4	4.0	4.5	2.35
28	3.3	3.6	4.9	4.3	4.6	†17.8	4.7	3.7	7.4	3.9	3.9	2.3
29	3.2	3.5	5.0	4.2	-------	16.8	4.6	4.4	7.5	3.8	3.6	2.35
30	3.1	4.0	4.6	5.0	-------	13.1	4.5	5.5	6.6	3.6	3.6	‡2.3
31	3.1	-------	4.2	5.4	-------	11.2	-------	5.9	-------	3.5	3.8	-------

NOTES—†Maximum 18.4 feet at 4 p. m. ‡Minimum 2.3 feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.3	14.6	3.8	2.5	3.0	11.5	5.7	6.2	6.4	3.5	3.2	3.3
2	2.3	10.4	3.8	2.5	3.0	10.1	5.6	6.4	5.8	3.3	2.8	2.5
3	2.3	8.5	3.9	2.5	3.0	9.9	5.8	6.2	5.2	3.3	2.7	2.6
4	2.3	7.4	3.8	2.5	3.0	9.5	6.5	5.9	4.8	3.3	2.6	2.55
5	2.3	6.5	3.8	2.4	*3.3	8.8	6.4	5.7	4.4	3.2	2.5	2.5
6	2.4	5.8	3.6	2.4	3.3	8.4	6.0	5.4	4.4	3.2	2.6	2.55
7	2.35	5.4	3.4	2.4	3.3	10.2	5.5	5.2	4.4	3.0	2.5	2.5
8	2.3	5.1	3.2	2.35	3.0	10.6	5.1	5.0	4.6	2.9	2.4	2.45
9	2.5	4.8	2.7	2.4	2.95	8.6	5.4	4.8	4.5	2.9	2.4	2.3
10	2.45	4.6	2.4	2.4	3.0	8.8	6.8	4.7	4.2	2.8	2.3	2.3
11	2.4	4.4	2.75	2.3	3.0	8.2	8.0	4.7	4.4	2.9	2.3	2.2
12	2.4	4.2	2.8	4.5	3.0	7.8	7.6	4.7	4.2	2.85	2.3	2.2
13	2.65	4.1	2.8	4.8	3.1	7.4	7.3	4.7	4.4	2.85	2.5	2.3
14	2.8	4.0	2.8	4.4	3.9	8.4	7.6	5.2	4.5	3.0	2.9	2.3
15	3.0	3.8	2.9	4.3	5.3	10.8	8.4	5.9	4.8	3.2	3.0	2.3
16	3.3	3.8	3.0	3.8	6.0	9.7	9.5	5.9	4.4	3.1	2.8	2.4
17	3.0	3.6	3.1	3.7	5.7	8.8	9.8	5.4	4.1	3.0	2.75	2.3
18	2.9	3.5	3.2	3.6	5.6	8.8	9.9	5.0	3.8	3.1	2.5	2.3
19	2.8	3.5	3.2	3.5	6.2	9.4	10.4	4.7	3.6	3.0	2.35	2.3
20	3.0	3.4	3.2	3.4	13.8	9.4	10.5	4.6	3.4	2.8	2.2	2.55
21	3.3	3.4	3.3	3.5	15.0	10.0	10.5	4.7	3.3	2.7	2.2	3.1
22	3.7	3.5	3.3	3.6	-------	10.2	11.0	5.4	3.9	2.7	2.1	3.5
23	3.8	3.8	3.4	3.5	9.2	10.4	12.3	5.4	4.6	2.6	2.1	3.5
24	3.7	4.4	3.3	3.6	8.2	9.8	11.0	5.2	4.9	2.6	2.05	3.4
25	4.6	4.6	3.2	3.5	7.8	9.0	10.2	4.9	4.4	2.65	2.05	3.2
26	5.3	4.2	3.0	3.2	15.2	8.2	9.6	4.7	4.0	2.6	2.0	3.0
27	5.6	3.6	2.9	3.2	14.2	7.6	7.8	4.5	3.7	2.5	2.0	3.4
28	4.9	3.5	2.8	3.2	13.2	7.0	7.2	7.1	3.6	2.5	1.95	4.4
29	5.1	3.4	2.6	3.2	-------	6.3	6.8	5.8	3.4	2.5	2.0	4.5
30	6.0	3.5	2.6	3.0	-------	6.0	6.4	5.5	3.2	2.5	2.05	4.3
31	16.1	-------	2.5	3.0	-------	5.8	-------	5.9	-------	3.5	2.1	-------

NOTES—* Top of ice February 5-7. Gage heights may have been affected by ice in December and January.

Daily discharge, in second-feet, of Delaware River at Riegelsville, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916–1917												
1	2,940	3,280	10,900	6,850	8,820	9,500	29,300	7,170	10,900	15,000	4,420	8,150
2	3,160	3,390	16,300	6,850	8,820	10,500	35,100	7,490	10,500	12,400	5,010	6,850
3	3,390	3,390	11,600	6,850	5,610	11,600	47,700	8,480	13,100	11,200	5,610	6,230
4	3,160	3,160	10,200	7,490	5,310	9,500	42,500	7,820	12,000	11,600	3,880	5,310
5	2,940	3,280	8,820	8,820	6,540	8,150	31,000	8,480	11,200	9,840	3,390	4,719
6	2,730	3,280	8,150	16,700	4,420	6,230	31,600	10,900	10,500	8,150	3,390	4,140
7	2,530	3,160	7,490	15,800	5,310	6,230	30,400	13,900	11,600	7,490	3,390	3,880
8	2,530	3,160	6,850	17,100	5,310	7,170	29,300	13,500	14,200	6,850	3,880	4,140
9	2,630	3,390	6,230	14,600	5,610	8,820	23,500	13,100	18,400	6,850	9,840	7,170
10	2,250	3,160	6,850	13,100	3,880	9,500	21,600	13,900	16,300	8,480	11,200	3,880
11	2,160	3,050	6,850	12,000	4,420	11,600	18,800	13,100	17,100	9,840	9,500	3,630
12	2,160	2,940	6,850	7,490	3,880	19,700	16,700	12,000	28,800	13,100	8,480	3,390
13	2,080	3,390	6,850	6,850	3,880	16,300	15,800	10,500	47,000	15,000	8,150	3,280
14	2,080	3,390	5,610	14,600	4,140	16,300	15,400	9,840	30,400	12,700	7,170	3,160
15	2,160	3,160	5,310	22,100	4,140	18,000	14,200	9,500	27,700	13,500	5,920	2,940
16	2,080	2,940	4,140	23,500	4,710	15,800	13,100	8,480	28,800	12,000	7,170	2,730
17	2,160	3,050	3,630	20,700	3,880	15,400	12,000	7,820	23,000	10,500	7,820	2,530
18	2,250	3,160	3,390	15,400	3,880	17,100	10,900	7,820	19,300	11,600	6,230	2,630
19	2,440	2,840	3,880	13,900	4,420	13,900	10,500	7,490	15,800	8,820	5,610	2,340
20	5,010	2,840	3,630	11,200	4,420	12,000	11,200	6,850	14,200	7,820	5,310	2,440
21	9,840	2,840	4,140	10,200	4,420	11,200	11,200	6,540	15,000	7,170	4,710	2,340
22	7,490	2,730	5,310	12,700	4,710	10,900	13,100	6,230	13,900	6,850	4,710	2,340
23	8,480	2,730	8,820	12,700	3,880	11,600	12,700	5,610	12,000	7,490	4,140	1,990
24	6,850	3,630	10,900	9,840	10,200	15,400	11,200	5,920	10,900	7,170	5,920	2,080
25	5,610	5,310	12,400	9,500	8,480	45,700	10,500	5,610	12,700	6,850	5,610	1,990
26	5,010	6,850	10,900	7,490	6,230	56,000	9,500	5,610	11,600	6,850	9,840	1,990
27	4,420	6,540	9,840	6,540	6,230	58,100	8,820	5,310	10,900	6,230	7,820	2,080
28	4,140	5,010	9,160	7,170	8,150	†86,100	8,480	5,310	18,800	5,920	5,920	1,990
29	3,880	4,710	9,500	6,850	-------	78,600	8,150	7,490	19,300	5,610	5,010	2,080
30	3,630	6,230	8,150	9,500	-------	51,800	7,820	11,200	15,400	5,010	5,010	‡1,990
31	3,630	-------	6,850	10,900	-------	39,300	-------	12,700	-------	4,710	5,610	-------

NOTES—†Maximum=88,400 second-feet. ‡Minimum=1,990 second-feet. Add 230 second-feet for canal October 1, to December 20, 1916, and March 17 to September 30, 1917, before computing "per square mile".

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1,990	62,400	5,610	2,340	3,390	44,200	12,000	13,900	14,600	4,710	3,880	4,140
2	1,990	34,500	5,610	2,340	3,390	32,700	11,600	14,600	12,400	4,140	2,940	2,340
3	1,990	24,000	5,920	2,340	3,390	31,600	12,400	13,900	10,200	4,140	2,730	2,530
4	1,990	18,800	5,610	2,340	3,390	29,300	15,000	12,700	8,820	4,140	2,530	2,440
5	1,990	15,000	5,610	2,160	*3,390	25,600	14,600	12,000	7,490	3,880	2,340	2,340
6	2,160	12,400	5,010	2,160	3,390	23,500	13,100	10,900	7,490	3,880	2,530	2,440
7	2,080	10,900	4,420	2,160	3,390	33,300	11,200	10,200	7,490	3,390	2,340	2,340
8	1,990	9,840	3,880	2,080	3,390	35,700	9,840	9,500	8,150	3,160	2,160	2,250
9	2,340	8,820	2,730	2,160	3,280	24,500	10,900	8,820	7,820	3,160	2,160	1,990
10	2,250	8,150	2,160	2,160	3,390	25,600	16,300	8,480	6,850	2,940	1,990	1,990
11	2,160	7,490	2,840	1,990	3,390	22,600	21,600	8,480	7,490	3,160	1,990	1,820
12	2,160	6,850	2,940	7,820	3,390	20,700	19,700	8,480	6,850	3,050	1,990	1,820
13	2,630	6,540	2,940	8,820	3,630	18,800	18,400	8,480	7,490	3,050	2,310	1,990
14	2,940	6,230	2,940	7,490	5,920	23,500	19,700	10,200	7,820	3,390	3,160	1,990
15	3,390	5,610	3,160	7,179	10,500	36,900	23,500	12,700	8,820	3,880	3,390	1,990
16	4,140	5,610	3,390	5,610	13,100	30,400	29,300	12,700	7,490	3,630	2,940	2,160
17	3,390	5,010	3,630	5,310	12,000	25,600	31,000	10,900	6,540	3,390	2,840	1,990
18	3,160	4,710	3,880	5,010	11,600	25,600	31,600	9,500	5,610	3,630	2,340	1,990
19	2,940	4,710	3,880	4,710	13,900	28,800	34,500	8,480	5,010	3,390	2,080	1,990
20	3,390	4,420	3,880	4,420	56,700	28,800	35,100	8,150	4,420	2,940	1,820	2,440
21	4,140	4,420	4,140	4,710	65,300	32,100	35,100	8,480	4,140	2,730	1,820	3,630
22	5,310	4,710	4,140	5,010	46,500	33,300	38,100	10,900	5,920	2,730	1,660	4,710
23	5,610	5,610	4,420	4,710	27,700	34,500	46,400	10,900	8,150	2,530	1,660	4,710
24	5,310	7,490	4,140	5,010	22,600	31,000	38,100	10,200	9,160	2,530	1,580	4,420
25	8,150	8,150	3,880	4,710	20,700	26,600	33,300	9,160	7,490	2,630	1,580	3,880
26	10,500	6,850	3,390	3,880	66,800	22,600	24,500	8,480	6,230	2,530	1,500	3,390
27	11,600	5,010	3,160	3,880	59,500	19,700	20,700	7,820	5,310	2,340	1,500	4,420
28	9,160	4,710	2,940	3,880	52,500	17,100	18,000	17,500	5,010	2,340	1,420	7,490
29	9,840	4,420	2,530	3,880	-------	14,200	16,300	12,400	4,420	2,340	1,500	7,820
30	13,900	4,710	2,530	3,390	-------	13,100	14,600	11,200	3,880	2,340	1,580	7,170
31	73,300	-------	2,340	3,390	-------	12,400	-------	12,700	-------	4,710	1,660	-------

NOTES—*Gage read to top of ice February 5 to 7; discharge interpolated. No other corrections for ice although stage—discharge relation may have been affected in December and January. No water in canal December 10 to March 15. Add 230 sec. ft. for canal October 1 to December 9 and March 16 to September 30.

Daily discharge, in second-feet, of Delaware River at Reigelsville, for the period October 1,

Estimated Monthly Discharge of Delaware River at Riegelsville.
(Drainage area 6,430 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	9,840	2,080	3,740	0.617	0.71
November	6,850	2,730	3,670	0.607	0.68
December	16,300	3,390	7,730	1.22	1.41
January	23,500	6,540	11,800	1.84	2.12
February	10,200	3,880	5,490	0.854	0.89
March	†86,100	6,230	22,800	3.58	4.13
April	47,700	7,820	18,700	2.95	3.29
May	13,900	5,310	8,890	1.42	1.64
June	47,000	10,500	17,400	2.74	3.06
July	15,000	4,710	9,120	1.45	1.67
August	11,200	3,390	6,120	0.988	1.14
September	8,150	‡1,990	3,480	0.577	0.64
The year	86,100	1,990	9,940	1.57	21.38

NOTES—†Maximum=88,400 second-feet March 28, 1917. ‡Minimum=1,990 second-feet September 30, 1917. In order to determine the discharge per square mile and the run-off depth in inches, 230 second-feet were added October 1 to December 20, 1916, and March 17 to September 30, 1917, before computing the discharge per square mile. Hence the first three columns indicate the actual quantity of water available in the river and the two remaining columns represent the actual run-off from the drainage area above Riegelsville, including the discharge of the canal.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	73,300	1,990	6,710	1.08	1.24
November	62,400	4,420	10,600	1.68	1.87
December	5,920	2,160	3,800	0.60	0.69
January	8,820	1,990	4,100	0.638	0.74
February	66,800	3,280	18,900	2.94	3.06
March	44,200	12,400	26,600	4.15	4.78
April	46,400	9,840	22,500	3.55	3.96
May	17,500	8,150	10,700	1.71	1.97
June	14,600	3,880	7,290	1.17	1.30
July	4,710	2,340	3,250	0.541	0.62
August	3,880	1,420	2,190	0.376	0.43
September	7,820	1,820	3,220	0.587	0.60
The year	73,300	1,420	9,910	1.54	21.26

NOTE—In order to determine the discharge per square mile and the run-off depth in inches, 230 second-feet were added October 1 to December 9, 1917, and March 16 to September 30, 1918, before computing the discharge per square mile. Hence the first three columns indicate the actual quantity of water available in the river and the two remaining columns represent the actual run-off from the drainage area above Riegelsville, including the discharge of the canal.

SCHUYLKILL RIVER AT SCHUYLKILL HAVEN

DESCRIPTION OF STATION

Location.—At five arch, stone masonry, P. & R. Railway bridge at Schuylkill Haven, Schuylkill County.

Records Available.—Discharge complete from May 7, 1914, to September 30, 1916, and discharge measurements and gage heights October 1, 1916, to June 22, 1918. For other records on this river see Schuylkill River at Reading; also Schuylkill River at Fairmount Dam, Philadelphia, in the 1910-11 and 1912 Reports, and Schuylkill River at Conshohocken in the 1914 to 1916 reports of the Water Supply Commission.

Drainage Area.—127 square miles.

Gage.—A standard chain gage, whose elevation of zero is 504.40 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by Robert Zimmerman.

Channel.—Both banks are high and not subject to overflow, and the bed is culm covered and not permanent.

Discharge Measurements of Schuylkill River at Schuylkill Haven, Schuylkill County
(Drainage area 127 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1916		Sq. ft.	Feet	Sec.-ft.	
19	Dec. 12	Boehringer	68	1.72	142	0.6 method
	1917					
20	Mar. 19	Brown & Heagy	231	2.94	511	0.6 method
21	Mar. 26	Brown & Heagy	241	3.11	535	Surf. & 0.6 method
22	April 18	Brown	157	2.70	232	0.6 method
23	April 26	Brown	136	2.40	171	0.6 method
24	May 19	Brown & Heagy	84	1.92	106	Surf. & 0.6 method
25	July 20	Brown & Heagy	96	2.06	116	0.6 method
26	Aug. 7	Wilson & Brown	62	2.07	80	Surf. & 0.6 method
	1918					
27	June 12	Hosmer & Landis	153	2.59	256	0.6 method

Daily Mean Gage Heights, in feet, of Schuylkill River at Schuylkill Haven, Schuylkill County, for the period October 1, 1916 to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.44	1.38	1.8	2.0	3.1	2.3	3.6	2.3	2.1	2.3	2.5	2.8
2	1.32	1.32	1.8	2.0	2.7	2.3	3.6	2.3	2.3	2.2	2.5	2.7
3	1.37	1.26	1.8	2.1	*2.3	2.3	3.4	2.2	2.2	2.2	2.3	2.7
4	1.34	1.28	1.7	2.2	2.5	2.3	3.3	2.2	2.2	2.1	‡2.3	2.7
5	1.31	1.28	1.8	2.8	2.4	2.3	3.3	2.4	2.2	2.1	‡2.2	2.6
6	1.30	1.25	1.7	3.1	3.7	2.3	3.8	2.3	2.3	2.1	‡2.1	2.7
7	1.29	1.5	1.7	3.1	3.8	2.3	3.6	2.3	2.4	2.1	2.0	2.6
8	1.30	1.49	1.6	3.1	3.0	2.4	3.5	2.3	2.3	2.1	2.6	3.1
9	1.30	1.46	1.5	3.0	2.4	2.4	3.4	2.2	2.3	2.3	4.0	2.8
10	1.24	1.43	1.6	2.9	3.2	2.8	3.3	2.2	2.3	2.4	4.0	2.6
11	1.20	1.40	1.6	2.8	3.1	3.1	3.2	2.2	2.6	2.3	3.7	2.6
12	1.18	1.38	1.7	2.6	3.5	3.2	3.2	2.1	2.7	2.2	3.5	2.6
13	1.5	1.34	1.6	2.6	3.7	3.2	3.1	2.1	2.6	2.2	3.3	2.6
14	1.49	1.28	1.6	3.3	3.5	3.1	3.0	2.1	2.6	2.2	3.3	2.6
15	1.40	1.23	1.5	3.2	2.4	3.0	2.9	2.0	2.7	2.2	3.1	2.8
16	1.38	1.19	1.38	3.4	2.2	3.1	2.9	2.0	2.9	2.3	3.1	2.8
17	1.34	1.10	1.7	3.3	2.3	3.0	2.8	2.0	2.8	2.3	3.0	2.8
18	1.30	††1.12	1.6	3.3	2.3	3.0	2.7	1.9	2.7	2.2	2.9	2.7
19	1.26	1.14	1.6	3.0	2.2	3.0	2.7	2.0	2.7	2.1	2.9	2.7
20	2.0	1.12	1.5	2.8	2.3	3.0	2.6	2.0	2.6	2.1	2.8	2.7
21	1.8	1.16	1.5	2.9	2.2	2.9	2.6	2.0	2.8	2.1	2.8	2.6
22	1.6	1.20	2.3	3.4	2.6	2.9	2.5	2.0	2.6	2.2	2.8	2.7
23	1.5	1.44	2.6	3.2	3.0	3.0	2.5	2.0	2.5	2.2	2.8	2.6
24	1.44	1.6	2.4	2.8	3.0	3.2	2.5	1.9	2.4	2.2	2.8	2.5
25	1.38	1.42	2.0	2.7	2.7	3.2	2.4	1.9	2.4	2.2	2.8	2.5
26	1.34	1.34	1.9	2.6	2.6	3.2	2.4	1.8	2.5	2.1	2.7	2.5
27	1.30	1.32	2.0	2.4	2.6	†4.1	2.4	1.8	2.4	2.1	2.3	2.4
28	1.28	1.30	2.4	2.4	2.5	4.6	2.4	1.8	2.3	2.1	2.6	2.4
29	1.26	1.27	2.2	2.5	-------	4.0	2.4	2.3	2.5	2.1	3.5	2.4
30	1.45	1.38	2.1	3.3	-------	4.0	2.3	2.1	2.4	2.1	3.2	2.4
31	1.43	-------	2.1	2.8	-------	3.7	-------	1.9	-------	2.0	2.8	-------

NOTE—*River frozen February 3 to 14, 1917 inclusive. †Maximum 5.0 feet at 10:00 p. m. estimated from hydrograph. ††Estimated. ‡Minimum 1.07 feet at 7:45 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June
1917-1918									
1	2.3	4.2	2.6	---------	3.3	4.4	2.6	3.2	2.4
2	2.3	4.1	2.5	---------	3.4	4.3	2.6	3.2	2.4
3	2.3	3.9	2.5	---------	3.5	4.1	2.6	3.2	2.6
4	††2.3	3.8	2.5	---------	3.7	4.0	2.6	3.2	2.6
5	††2.3	3.6	2.5	---------	3.7	3.9	2.5	3.2	2.5
6	††2.3	3.5	2.5	---------	3.7	3.8	2.4	3.2	2.5
7	††2.3	3.5	2.5	---------	3.6	3.9	2.4	3.3	2.4
8	††2.3	3.4	*2.5	---------	3.6	3.8	2.4	3.3	2.4
9	2.3	3.4	2.8	---------	3.4	3.7	3.1	3.3	2.5
10	2.3	3.4	2.8	---------	3.4	3.7	3.4	3.2	2.4
11	2.2	3.3	---------	---------	3.4	3.6	3.5	3.2	2.4
12	2.4	3.1	---------	---------	3.4	3.5	3.4	3.2	2.4
13	2.4	3.0	---------	3.9	3.5	3.5	3.3	3.1	2.4
14	2.4	3.0	---------	4.0	3.6	4.3	3.4	3.2	2.4
15	2.3	3.0	---------	4.1	3.9	4.1	3.5	3.1	2.3
16	2.3	2.9	---------	4.0	4.0	4.0	3.7	3.1	2.3
17	2.2	2.9	2.8	4.0	3.8	3.8	3.9	3.0	3.0
18	2.2	2.9	2.8	3.8	3.7	3.6	3.9	3.0	2.8
19	2.5	2.8	2.8	3.9	3.9	3.5	3.8	2.9	2.8
20	2.8	2.8	2.7	3.9	†5.5	3.4	3.6	2.9	2.8
21	2.8	2.7	2.7	4.0	5.0	3.3	3.6	2.8	2.8
22	2.7	2.8	2.6	4.0	4.3	3.2	3.8	2.8	2.7
23	2.7	2.8	2.7	4.0	4.2	3.2	3.5	2.7	---------
24	3.2	2.8	---------	4.0	4.1	3.2	3.5	2.6	---------
25	3.0	2.7	---------	4.0	4.2	3.2	3.5	2.6	---------
26	2.8	2.7	---------	4.0	†5.4	3.0	3.4	2.6	---------
27	2.7	2.6	---------	4.0	5.0	2.9	3.4	2.5	---------
28	3.2	2.6	---------	4.0	4.7	2.8	3.4	2.6	---------
29	3.1	2.6	---------	4.0	---------	2.7	3.3	2.6	---------
30	4.4	2.5	---------	4.0	---------	2.7	3.3	2.5	---------
31	4.4	---------	---------	3.5	---------	2.6	---------	2.5	---------

NOTES—*Gage heights affected by ice December 8, 1917 to February 8, 1918. †Maximum 5.7 feet from hydrograph. ††Estimated.

DELAWARE BASIN—STATION NO. 11

LITTLE SCHUYLKILL RIVER AT TAMAQUA

DESCRIPTION OF STATION

Location.—At three span, stone arch, highway bridge at Broad Street, Tamaqua, Schuylkill County.

Records Available.—Discharge measurements and gage heights from June 23, 1916, to September 30, 1918. For other records on this river see Little Schuylkill River at Molino.

Drainage Area.—44 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge and is read twice daily by William P. Griffiths.

Channel.—Section is entirely walled in above and below the bridge, and only overflows during extreme floods, and the bed is rocky and permanent.

Discharge Measurements of Little Schuylkill River at Tamaqua, Schuylkill County
(Drainage area 44 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq.ft.	Feet	Sec.-ft.	
5	Feb. 12	Wilson & Brown,	39	2.84	59	Under ice cover
6	Feb. 19	Wilson & Brown,	60	2.43	56	Partly under ice cover
7	Feb. 26	Wilson & Brown,	50	2.29	66	Wading 5 feet above gage
8	March 3	Wilson & Brown,	56	2.32	78	Wading measurement
9	March 20	Brown & Heagy,	74	2.48	142	Surf. & 0.6 method
10	March 24	Brown & Heagy,	101	2.83	270	Surf. & 0.6 method
11	April 18	Brown,	67	2.36	94	Surf. & 0.6 method
12	April 26	Brown,	57	2.23	64	Surface method
13	July 19	Brown & Heagy,	61	2.39	49	Surf. & 0.6 method
	1918					
14	June 12	Hosmer & Landis,	62	2.28	97	Partly by wading.

Daily Mean Gage Heights, in feet, of Little Schuylkill River at Tamaqua, Schuylkill County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916–1917												
1	2.17	2.27	2.56	3.35	2.92	2.32	2.71	2.24	2.25	2.31	2.15	2.20
2	2.16	2.27	2.56	2.83	2.52	2.27	2.72	2.20	2.34	2.29	2.17	2.18
3	2.16	2.22	2.56	2.60	*2.79	2.28	2.65	2.19	2.30	2.25	2.14	2.18
4	2.16	2.22	2.56	2.57	2.74	2.27	2.61	2.21	2.29	2.24	2.10	2.15
5	2.14	2.22	2.56	2.93	2.99	2.22	2.60	2.32	2.30	2.19	2.10	2.15
6	2.13	2.22	2.46	3.00	3.46	2.42	2.91	2.25	2.45	2.23	2.12	2.14
7	2.13	2.19	2.46	2.95	3.29	2.40	2.84	2.24	2.48	2.27	2.20	2.13
8	2.13	2.17	2.46	2.87	2.92	2.27	2.75	2.22	2.65	2.29	2.48	2.41
9	2.10	2.17	2.54	2.85	2.52	2.40	2.70	2.22	2.57	2.43	3.32	2.25
10	2.10	2.18	2.51	2.80	3.49	2.44	2.63	2.26	2.55	2.41	3.02	2.15
11	2.10	2.17	2.46	2.80	3.49	2.67	2.61	2.30	2.75	2.33	2.84	2.12
12	2.10	2.17	2.46	2.85	2.84	3.02	2.60	2.19	2.71	2.29	2.72	2.13
13	2.14	2.17	2.46	3.00	2.64	2.64	2.55	2.16	2.69	2.31	2.59	2.11
14	2.18	2.29	2.66	3.57	2.46	2.52	2.50	2.15	2.65	2.37	2.54	2.10
15	2.16	2.19	2.76	3.05	2.36	2.57	2.45	2.13	2.64	2.40	2.48	2.10
16	2.13	2.17	*2.71	2.90	2.34	2.47	2.41	2.13	2.73	2.29	2.74	2.10
17	2.13	2.17	**	2.83	2.22	2.74	2.39	2.12	2.61	2.34	2.55	2.05
18	2.13	2.17	-------	2.75	2.49	2.60	2.36	2.12	2.59	2.39	2.42	2.06
19	2.50	2.17	-------	2.70	2.55	2.42	2.36	2.14	2.53	2.39	2.40	2.05
20	2.63	2.17	-------	2.65	2.40	2.46	2.37	2.12	2.49	2.27	2.38	2.05
21	2.47	2.17	-------	2.63	2.79	2.42	2.32	2.14	2.56	2.18	2.35	2.05
22	2.37	2.12	-------	2.83	2.64	2.44	2.31	2.14	2.45	2.36	2.36	2.05
23	2.33	2.22	-------	2.67	2.39	2.44	2.29	2.19	2.43	2.33	2.31	2.05
24	2.29	2.49	-------	2.60	2.92	2.82	2.26	2.14	2.39	2.26	2.42	‡2.03
25	2.40	2.37	-------	2.50	2.34	2.67	2.25	2.12	2.37	2.20	2.28	2.03
26	2.39	2.37	-------	2.50	2.31	2.60	2.25	2.10	2.33	2.20	2.24	2.03
27	2.29	2.27	-------	2.53	2.41	†3.53	2.25	2.10	2.43	2.17	2.22	2.03
28	2.28	2.29	2.71	2.60	2.44	3.37	2.21	2.16	2.31	2.14	2.20	2.06
29	2.28	2.29	2.86	2.55	-------	3.12	2.21	2.41	2.41	2.23	2.20	2.05
30	2.26	2.79	3.11	2.83	-------	2.94	2.21	2.32	2.37	2.19	2.28	‡2.04
31	2.24	-------	3.26	2.50	-------	2.80	-------	2.20	-------	2.18	2.20	-------

NOTES—*River frozen December 14, 1916, to January 4, 1917, and February 3 to 21, 1917, inclusive. **Gage not read due to ice conditions. †Maximum 4.40 feet at 8 p. m. estimated from hydrograph. ‡Minimum 2.03 feet September 24 to 27, 1917, inclusive, and September 30, 1917 at 5 p. m.

Day	Oct.	Nov	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.01	2.98	2.29	2.58	4.10	2.84	2.15	2.52	2.39	2.10	2.03	1.83
2	2.00	2.81	2.22	2.71	4.10	2.75	2.15	*2.40	2.31	2.02	2.00	1.81
3	2.00	2.69	2.32	2.77	4.10	2.66	2.18	2.36	2.28	1.98	1.93	1.81
4	2.02	2.64	2.26	2.85	4.10	2.60	2.16	2.23	2.28	1.98	1.90	‡1.80
5	2.02	2.56	2.20	2.93	4.10	2.58	2.11	2.42	2.24	1.98	1.94	‡1.79
6	2.02	2.50	2.14	2.98	4.10	2.60	2.10	2.34	2.32	1.98	1.90	2.26
7	2.00	2.45	2.24	3.00	4.09	2.61	2.08	2.30	2.44	1.96	1.88	1.96
8	2.00	2.42	*2.65	3.10	4.05	2.55	2.08	2.28	2.24	1.93	1.88	2.06
9	2.00	2.42	2.86	3.05	4.08	2.51	2.46	2.25	2.18	1.93	1.86	1.88
10	2.00	2.41	2.67	3.07	4.05	2.62	2.40	2.26	2.14	1.93	1.88	1.85
11	2.00	2.34	2.42	3.05	4.05	2.76	2.44	2.28	2.24	1.94	1.88	1.83
12	2.26	2.29	2.31	3.28	4.05	2.56	2.44	2.23	2.24	1.93	1.88	1.90
13	2.22	2.29	2.30	4.35	4.30	2.46	2.46	2.39	2.18	1.93	1.88	1.98
14	2.12	2.30	2.26	4.36	4.45	3.02	2.59	2.43	2.13	1.93	2.14	1.88
15	2.04	2.27	2.54	4.22	4.52	2.92	3.09	2.29	2.13	1.93	1.96	1.85
16	2.01	2.25	2.67	4.30	4.68	2.77	3.18	2.38	2.08	1.93	1.90	1.83
17	2.00	2.22	2.64	4.25	4.50	2.72	2.98	2.36	2.08	1.93	1.83	1.85
18	2.00	2.20	2.56	4.20	4.36	2.65	3.06	2.30	2.08	1.98	1.83	2.10
19	2.24	2.20	2.52	4.14	4.00	2.57	2.88	2.28	2.04	1.93	1.83	2.08
20	2.35	2.21	2.46	4.10	4.18	2.54	2.74	2.28	2.03	1.91	1.83	2.18
21	2.15	2.24	2.40	4.10	3.32	2.49	2.96	2.48	2.03	1.88	1.83	2.26
22	2.08	2.26	2.40	4.10	3.04	2.44	2.98	2.28	2.43	1.86	1.82	2.16
23	2.06	2.29	2.40	4.10	2.82	2.40	2.95	2.30	2.21	1.87	1.81	2.09
24	2.41	2.30	2.34	4.11	2.78	2.40	2.83	2.23	2.08	1.96	1.83	2.06
25	2.43	2.38	2.35	4.13	2.82	2.38	2.70	2.32	2.05	1.93	1.83	2.03
26	2.32	2.68	2.36	4.10	†3.75	2.30	2.64	2.27	2.03	1.86	1.88	2.03
27	2.30	2.51	2.35	4.10	3.14	2.30	2.57	2.26	2.05	1.86	1.84	2.03
28	2.26	2.28	2.44	4.10	3.00	2.24	2.50	2.64	2.02	1.84	1.83	1.98
29	2.28	2.34	2.40	4.12	-------	2.23	2.48	2.40	2.00	1.82	1.88	1.98
30	3.38	2.16	2.46	4.12	-------	2.20	2.46	2.42	1.98	2.40	1.83	1.93
31	3.22	-------	2.48	4.12	-------	2.20	-------	2.46	-------	2.13	1.83	-------

NOTES—*Gage heights affected by ice December 8, 1917 to February 20, 1918. †Maximum 3.95 feet at 8 a. m. ‡Minimum 1.79 feet.

DELAWARE BASIN—STATION NO. 12

LITTLE SCHUYLKILL RIVER AT MOLINO

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge at Molino, Schuylkill County.

Records Available.—Discharge measurements and gage heights from May 7, 1914, to September 30, 1918. For other records on this river see Little Schuylkill River at Tamaqua.

Drainage Area.—132 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the downstream side of the bridge and is read daily by Frank A. Schickram.

Channel.—Both banks are low but not subject to overflow, and the bed is culm covered and not permanent.

Discharge Measurements of Little Schuylkill River at Molino, Schuylkill County
(Drainage area 132 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1918		Sq.ft.	Feet	Sec.-ft.	
17	June 12	Hosmer & Landis	124	1.50	172	0.6 method

Daily Mean Gage Heights, in feet, of Little Schuylkill River at Molino, Schuylkill County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.53	0.65	1.3	1.8	1.9	1.4	2.4	1.2	1.0	1.4	1.1	2.0
2	0.53	0.72	1.2	1.6	1.7	1.2	2.3	1.2	1.1	1.4	1.2	2.0
3	0.53	0.64	1.2	1.3	1.3	1.1	2.2	1.1	1.2	1.4	1.1	1.8
4	0.48	0.62	1.2	1.5	*1.4	1.0	1.9	1.1	1.2	1.4	0.97	1.7
5	‡0.43	0.70	1.1	2.0	1.5	1.0	1.8	1.3	1.2	1.3	1.0	1.6
6	0.45	0.62	1.0	2.8	**_____	1.0	2.8	1.2	1.5	1.3	1.0	1.6
7	0.53	0.62	1.0	2.5	_____	1.0	2.8	1.2	1.4	1.2	1.3	1.6
8	0.53	0.60	1.0	2.4	_____	0.98	2.6	1.1	1.7	1.2	1.3	1.7
9	0.48	0.60	1.0	2.2	_____	1.5	2.5	1.1	1.6	1.2	3.6	1.7
10	0.51	0.52	1.2	2.1	_____	1.5	2.3	1.1	1.5	1.6	3.0	1.6
11	0.51	0.48	1.1	2.0	_____	1.9	2.2	1.1	1.6	1.5	2.4	1.5
12	0.51	0.47	1.0	1.6	_____	3.1	2.1	1.1	2.4	1.3	2.2	1.5
13	0.53	0.50	1.0	1.7	_____	2.0	2.1	1.1	2.0	1.4	1.9	1.4
14	0.63	0.47	1.0	†4.4	_____	1.8	1.9	0.98	2.0	1.3	1.7	1.4
15	0.56	0.57	1.0	2.7	_____	1.8	1.9	0.98	2.0	1.9	1.7	1.4
16	0.53	0.47	*1.2	2.5	_____	1.7	1.7	0.98	2.7	1.5	1.6	1.4
17	0.51	0.47	1.2	2.2	_____	1.8	1.5	0.98	2.2	1.4	2.3	1.4
18	0.46	0.49	1.2	2.1	_____	2.2	1.5	0.96	2.2	1.4	1.8	1.4
19	0.51	0.50	1.3	2.0	_____	1.8	1.4	0.94	2.0	1.4	1.7	1.3
20	1.6	0.50	1.2	1.9	_____	1.7	1.5	0.91	2.0	1.3	1.6	1.3
21	1.8	0.50	1.2	1.7	_____	1.6	1.4	0.91	2.6	1.2	1.6	1.3
22	1.1	0.50	1.4	2.5	_____	1.6	1.4	0.91	2.0	1.2	2.0	1.2
23	0.98	0.52	2.0	1.9	_____	1.7	1.3	0.98	2.0	1.7	1.6	1.2
24	1.0	1.0	1.7	1.8	_____	2.5	1.2	0.91	2.0	1.3	3.2	1.2
25	0.93	0.72	1.4	1.6	_____	2.2	1.2	0.88	1.8	1.3	2.0	1.2
26	0.93	0.67	1.5	1.5	_____	2.0	1.2	0.86	1.7	1.2	1.8	1.1
27	0.88	0.70	1.3	1.5	1.8	2.6	1.2	0.83	1.7	1.2	1.6	1.1
28	0.76	0.60	1.7	1.6	1.6	4.2	1.2	0.81	1.6	1.1	1.6	1.2
29	0.73	0.62	1.6	1.3	_____	3.5	1.2	1.4	1.6	1.2	1.6	1.2
30	0.71	1.5	1.6	1.8	_____	2.9	1.2	1.1	1.7	1.2	2.7	1.1
31	0.68	_____	1.8	1.8	_____	2.6	_____	0.96	_____	1.2	1.9	_____

NOTES—*River partly frozen December 16 to 22, 1916 and February 4 and 5, 1917; River frozen February 6 to 26, 1917, inclusive. **Gage not read due to ice conditions †Maximum 4.6 feet at noon estimated from hydrograph. ‡Minimum 0.43 feet at 6.35 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.0	3.1	1.7	2.3	_____	2.9	1.5	2.2	1.9	1.4	1.4	1.2
2	1.0	2.8	1.6	2.4	_____	2.8	1.4	2.0	1.8	1.4	1.2	1.1
3	‡0.98	2.6	1.5	2.4	_____	2.6	1.5	1.9	1.8	1.3	1.2	1.0
4	1.6	2.4	1.5	2.4	_____	2.4	1.6	1.8	1.7	1.4	1.2	1.1
5	1.1	2.3	1.4	2.4	_____	2.5	1.4	1.8	1.7	1.3	1.2	1.1
6	1.1	2.2	1.4	2.4	3.0	2.5	1.4	1.9	1.6	1.2	1.2	2.0
7	1.0	2.1	1.4	2.4	3.0	2.5	1.3	1.7	1.6	1.2	1.2	1.4
8	1.0	2.0	1.4	2.7	3.0	2.4	1.3	1.7	1.7	1.2	1.1	1.2
9	1.0	2.0	*1.4	2.6	3.0	2.2	2.2	1.6	1.5	1.2	1.1	1.2
10	1.0	2.0	1.6	2.5	3.0	2.5	2.8	1.6	1.5	1.2	1.1	1.2
11	0.98	1.9	1.7	2.5	3.0	2.3	2.9	1.7	1.7	1.2	1.1	1.2
12	1.0	1.8	1.6	2.7	3.1	2.2	2.8	1.6	1.6	1.2	1.1	1.2
13	1.6	1.7	1.4	3.4	3.6	2.2	2.6	1.6	1.6	1.2	1.2	1.3
14	1.2	1.7	1.5	3.3	4.5	3.2	3.4	2.3	1.5	1.3	1.4	1.2
15	1.1	1.7	1.6	3.3	4.8	3.0	3.5	2.0	1.5	1.3	1.2	1.2
16	1.1	1.6	1.6	3.3	5.7	2.7	3.5	1.9	1.4	1.2	1.2	1.1
17	1.0	1.6	1.7	3.3	4.7	2.5	3.3	1.9	1.4	1.3	1.2	1.2
18	1.0	1.6	1.7	_____	3.6	2.5	3.3	1.8	1.4	1.3	1.1	1.2
19	1.0	1.6	2.0	_____	3.8	2.3	2.7	1.7	1.4	1.2	1.1	1.4
20	1.6	1.6	2.6	_____	8.7	2.2	2.5	1.7	1.4	1.2	1.1	1.2
21	1.3	1.6	2.6	_____	7.6	2.1	2.9	1.9	1.3	1.1	1.1	1.6
22	1.2	1.6	2.5	_____	5.8	2.1	3.6	2.0	2.5	1.1	1.1	1.4
23	1.1	1.8	2.2	_____	6.0	2.0	3.1	1.8	1.6	1.1	1.1	1.4
24	1.3	1.7	2.2	_____	2.9	1.8	3.3	1.7	1.5	1.1	1.1	1.4
25	1.8	1.5	2.4	_____	3,1	1.9	2.7	1.7	1.4	1.4	1.0	1.3
26	1.6	1.4	2.4	_____	†4.9	1.7	2.5	1.7	1.4	1.3	1.0	1.3
27	1.8	1.4	2.4	_____	3.6	1.6	2.4	1.6	1.4	1.2	1.2	1.4
28	2.1	1.4	2.3	_____	3.1	1.6	2.3	2.7	1.4	1.1	1.1	1.3
29	2.0	1.4	2.2	_____	_____	1.5	2.2	2.0	1.4	1.1	1.2	1.2
30	3.5	1.4	2.0	_____	_____	1.5	2.2	1.9	1.3	1.2	1.1	1.2
31	3.8	_____	2.2	_____	_____	1.5	_____	1.3	_____	1.7	1.1	_____

NOTES—*Gage heights affected by ice December 9, 1917 to February 23,1918, †Maximum 5.4 feet from hydrograph at 7 a. m. ‡Minimum 0.98 foot.

DELAWARE BASIN—STATION NO. 13

SCHUYLKILL RIVER AT READING

DESCRIPTION OF STATION

Location.—At concrete viaduct at Penn Street, Reading, Berks County.

Records Available.—Discharge complete from May 6, 1914, to September 30, 1915, and discharge measurements and gage heights from October 1, 1915, to September 30, 1918. For other records on this river see Schuylkill River at Schuylkill Haven; also Schuylkill River at Fairmount Dam, Philadelphia, in the 1910-11 and 1912 reports, and Schuylkill River at Conshohocken in the 1914 to 1916 Reports of the Water Supply Commission.

Drainage Area.—900 square miles.

Gage.—A standard chain gage, whose elevation of zero is 188.50 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by Henry J. Kline.

Channel.—The right bank is high and not subject to overflow; the left is low and liable to overflow, and the bed is composed of gravel.

Remarks.—The Schuylkill Navigation Company Canal runs along the left bank of the river.

Discharge Measurements of Schuylkill River at Reading, Berks County
(Drainage area 900 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq.ft.	Feet	Sec.-ft.	
25	April 2	Bowen & Weaver	966	2.34	2514	26 sec. -ft. in canal 0.2 & 0.8 method
26	April 11	Bowen & Weaver	879	1.92	1968	48 sec. -ft. in canal 0.2 & 0.8 method
27	April 14	Bowen & Weaver	820	1.44	1554	36 sec. -ft. in canal 0.2 & 0.8 method
28	May 14	Brown & Heagy	567	0.38	656	55 sec. -ft. in canal 0.2 & 0.8 method
29	May 18	Brown & Heagy	493	0.00	522	36 sec. -ft. in canal 0.2 & 0.8 method
30	July 25	Boehringer	497	0.32	625	0.2 & 0.8 method
31	Oct. 10	Boehringer	390	-0.36	287	0.2 & 0.8 method
	1918					
32	Feb. 8	Wilson	372	-0.12	421	0.2 & 0.8 method
33	Feb. 15	Wilson	1,164	3.45	4,691	Surface method
34	June 11	Hosmer & Landis	691	1.12	1,236	0.2 & 0.8 method
35	June 25	Reckord & Landis	519	0.26	654	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Schuylkill River at Reading, Berks County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.0	0.0	1.0	1.3	2.2	1.3	2.6	0.6	0.3	0.6	0.3	1.1
2	—0.06	—0.01	0.7	1.4	2.1	0.9	2.4	0.6	0.6	0.4	0.9	1.1
3	—0.16	—0.31	0.6	1.2	1.0	0.9	2.4	0.5	0.6	0.4	0.4	0.9
4	—0.26	—0.21	0.6	1.6	1.0	0.8	2.0	0.2	0.5	0.3	0.2	0.7
5	—0.21	—0.11	0.6	2.2	1.0	0.9	1.9	0.9	0.4	0.3	—0.12	0.4
6	—0.16	—0.16	0.4	3.9	1.0	0.5	3.1	0.9	0.9	0.1	—0.04	0.4
7	—0.21	—0.16	0.3	3.3	0.8	0.4	2.9	0.9	1.0	0.1	—0.07	0.4
8	—0.21	—0.11	0.2	2.9	0.9	0.9	2.5	0.6	1.2	0.1	0.3	1.1
9	—0.21	—0.31	0.2	2.4	1.0	1.9	2.3	0.6	0.9	0.1	2.2	1.0
10	—0.16	—0.31	0.9	2.3	0.7	2.6	2.0	0.6	0.8	1.6	3.0	0.7
11	—0.21	—0.21	0.5	2.0	0.6	3.5	1.9	0.4	1.0	1.6	1.9	0.5
12	—0.26	—0.31	0.6	1.0	0.6	†5.6	1.7	0.4	2.4	1.2	1.5	0.4
13	—0.06	—0.26	0.4	1.2	0.4	3.5	1.7	0.3	1.7	1.3	1.2	0.4
14	—0.21	—0.16	0.0	3.8	0.2	2.6	1.5	0.4	1.7	1.0	0.9	0.3
15	—0.26	—0.21	—0.08	3.4	0.4	2.6	1.3	0.2	1.7	2.4	0.8	0.6
16	—0.26	‡—0.41	—0.23	2.8	0.4	2.5	0.7	0.2	3.0	1.5	0.7	0.6
17	—0.66	‡—0.41	—0.08	2.3	0.3	2.6	1.2	0.3	2.1	1.2	1.8	0.3
18	—0.16	—0.36	0.1	2.1	0.5	3.4	0.9	0.0	1.9	1.6	0.7	0.1
19	0.1	‡—0.46	0.2	1.8	0.9	2.4	0.9	0.1	1.6	1.1	0.5	0.1
20	0.6	—0.26	0.2	1.6	0.7	2.1	1.0	0.0	1.4	0.8	0.4	—0.37
21	0.4	—0.41	0.2	1.5	1.0	1.9	1.2	0.0	1.8	0.7	0.3	0.1
22	0.3	‡—0.46	0.8	3.0	0.7	1.9	0.9	—0.02	1.3	0.7	0.5	—0.12
23	—0.01	‡—0.31	2.6	2.6	0.4	1.9	1.0	0.0	1.1	0.6	0.4	—0.12
24	0.2	0.7	2.0	1.7	3.5	2.7	0.7	0.2	1.1	0.5	3.2	—0.16
25	0.1	0.3	1.8	1.6	2.2	2.9	0.6	0.0	1.0	0.3	1.4	—0.10
26	0.1	—0.31	1.4	1.2	1.4	2.6	0.6	0.0	0.7	0.4	0.8	—0.12
27	—0.01	—0.11	1.2	0.8	1.5	2.9	0.6	—0.05	0.7	0.3	0.7	—0.22
28	0.0	—0.01	1.7	1.0	1.8	5.5	0.4	0.0	0.7	0.3	0.5	0.1
29	—0.11	—0.01	2.2	1.1	-------	4.4	0.0	1.2	0.8	0.3	0.3	—0.02
30	—0.16	0.8	1.7	4.0	-------	3.5	0.6	0.8	0.8	0.3	2.0	—0.14
31	—0.11	-------	1.4	2.8	-------	3.0	-------	0.4	-------	0.2	1.0	-------

NOTES—†Maximum 6.6 feet at 3 p. m. estimated from hydrograph. ‡Minimum —0.49 feet. Canal in operation October 1 to December 15, 1916, and May 5 to September 30, 1917, except May 26 and 27, July 29 and 30, and September 28, 1917.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	—0.25	3.8	0.8	0.1	0.0	3.6	0.4	1.7	1.9	0.2	—0.45	—0.70
2	—0.23	3.0	0.6	0.1	0.0	3.2	0.7	1.6	1.5	0.1	—0.20	—0.45
3	—0.38	2.4	0.1	0.1	—0.07	3.0	0.7	1.4	1.3	—0.30	—0.40	—0.52
4	—0.53	2.1	0.3	0.1	—0.07	2.7	1.0	1.4	1.1	—0.15	—0.50	—0.65
5	—0.05	1.8	0.1	0.1	*0.3	2.5	0.7	1.2	1.0	—0.08	—0.70	—0.70
6	—0.15	1.6	0.1	0.1	—0.12	2.5	0.5	1.5	1.0	—0.18	—0.40	0.2
7	—0.15	1.3	0.0	0.1	—0.09	2.8	0.5	1.4	1.0	—0.18	—0.62	0.3
8	—0.33	1.2	—0.33	0.0	—0.12	2.7	0.3	1.1	1.1	—0.18	—0.62	—0.20
9	—0.33	1.1	—0.50	—0.06	0.1	2.4	1.1	1.0	0.7	—0.18	‡—0.75	—0.30
10	—0.37	1.0	*—0.13	—0.14	0.1	2.8	3.3	0.5	0.6	—0.32	—0.58	—0.30
11	—0.43	0.9	0.0	—0.16	0.2	2.3	3.7	0.9	0.9	—0.25	—0.55	—0.45
12	—0.33	0.9	0.1	0.9	0.4	2.3	3.6	0.8	1.2	—0.38	—0.58	—0.50
13	0.8	0.8	0.6	2.3	0.9	2.1	3.3	0.8	0.7	—0.12	—0.25	—0.40
14	0.0	0.3	0.5	1.8	2.9	3.7	3.2	2.2	0.4	0.3	0.1	—0.38
15	—0.15	0.5	0.4	1.2	4.6	3.7	3.6	1.7	0.0	0.0	—0.02	—0.55
16	—0.15	0.6	0.2	1.0	4.9	3.1	3.5	1.3	0.4	—0.30	—0.30	—0.62
17	—0.23	0.5	0.6	0.7	3.4	2.8	3.1	1.2	0.4	—0.10	—0.42	—0.60
18	—0.33	0.5	0.2	0.7	2.5	2.5	2.9	1.1	—0.20	—0.02	—0.45	—0.38
19	—0.33	0.4	0.3	0.6	2.4	2.2	2.5	1.0	0.0	—0.12	—0.45	0.2
20	0.6	0.3	0.1	0.4	†11.1	2.0	2.2	1.0	—0.03	0.1	—0.58	—0.05
21	0.4	0.4	0.2	0.6	5.9	1.8	2.8	1.0	—0.13	—0.38	—0.68	0.8
22	0.2	0.5	0.2	0.5	3.8	1.8	3.9	1.8	1.3	—0.35	—0.65	0.4
23	—0.05	0.8	0.2	0.4	3.1	1.5	3.4	1.4	1.0	—0.35	—0.68	0.2
24	1.2	0.5	0.1	0.3	2.7	1.4	3.1	1.2	0.5	—0.40	—0.72	0.0
25	2.3	0.2	0.2	0.2	2.6	1.4	2.8	1.2	0.2	0.4	—0.68	—0.12
26	1.6	0.0	0.2	0.1	10.8	1.3	2.4	1.1	0.2	0.0	—0.22	—0.08
27	1.2	—0.09	0.2	0.1	5.0	1.2	2.1	0.9	0.2	—0.25	—0.35	—0.10
28	1.8	0.1	0.1	0.1	4.1	1.0	2.9	2.7	0.2	—0.50	—0.48	—0.22
29	1.5	0.1	*—0.07	0.1	-------	1.0	1.8	2.1	0.0	—0.60	—0.58	—0.30
30	3.9	0.3	0.0	0.0	-------	1.0	1.8	1.6	0.0	—0.80	—0.48	—0.40
31	5.4	-------	0.1	0.0	-------	0.9	-------	1.9	-------	—0.75	—0.58	-------

NOTES—*Gage heights affected by ice December 10 to 23; December 29, 1917 to January 11, 1918; February 5 to 8. Canal in operation October 1 to December 3, 1917 and July 1 to September 30, 1918. †Maximum 12.3 feet from hydrograph at 10 a. m. ‡Minimum —0.85 foot.

DELAWARE BASIN—STATION NO. 14

PERKIOMEN CREEK AT GRATERS FORD

DESCRIPTION OF STATION

Location.—At two span, through truss, highway bridge at Graters Ford, Montgomery County.

Records Available.—Discharge measurements and gage heights from June 11, 1914, to September 30, 1918. For other records on this creek see Perkiomen Creek at Frederick or Spring Mount, in the 1910-11 and 1912 reports of the Water Supply Commission.

Drainage Area.—280 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge and is read twice daily by I. H. Smoyer. A Sanborn Automatic gage is located on the downstream end of the pier.

Channel.—The right bank is high and not subject to overflow, the left bank is of medium height and overflows during extreme stages, and the bed is composed of rock and gravel.

Discharge Measurements of Perkiomen Creek at Graters Ford, Montgomery County.
(Drainage area 280 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
21	Feb. 7	Wilson and Brown	234	3.11	105	Under ice cover.
22	Feb. 13	Wilson and Brown	182	2.73	62	Under ice cover.
23	Feb. 20	Wilson and Brown	235	3.10	121	Under ice cover
24	Feb. 27	Wilson and Brown	347	3.22	298	0.6 method.
25	April 5	Bowen and Weaver	317	3.05	221	0.2 & 0.8 method.
26	July 26	Boehringer	267	2.78	104	0.6 method.
27	Oct. 5	Wilson	40	2.08	41	Wading about 1200 ft. above bridge. 0.6 method.
28	Oct. 8	Wilson	53	2.53	38	Wading about 1200 ft. above bridge. 0.6 method.
29	Oct. 31	Wilson	584	4.65	1,096	0.2 & 0.8 method.
30	Oct. 31	Wilson	529	4.35	800	0.2 & 0.8 method.
31	Nov. 1	Wilson	460	3.97	441	0.2 & 0.8 method.
	1918					
32	Feb. 7	Wilson	178	3.68	72	Under ice cover.
33	Mar. 15	Leigh.		4.52	1,136	0.2 & 0.8 method.
34	Apr. 10	Wilson	500	4.27	972	0.2 & 0.8 method.
36	June 11	Hosmer and Landis	462	4.02	754	0.2 & 0.8 method.
35	Apr. 11	Wilson	500	4.33	943	0.2 & 0.8 method.

Daily Mean Gage Heights, in feet, of Perkiomen Creek at Graters Ford, Montgomery County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	3.57	3.08	3.86	4.2	3.52	**3.00	3.43	2.69	2.78	2.64	3.18	3.10
2	3.06	2.86	3.66	3.80	*4.4	2.81	3.28	2.69	2.86	2.97	3.08	3.30
3	3.10	2.90	3.62	3.62	3.65	2.88	3.24	2.68	2.89	3.92	2.69	3.16
4	3.22	3.04	3.50	4.2	3.36	2.92	3.08	2.83	2.56	3.03	2.67	3.06
5	3.48	3.27	3.26	5.2	3.26	2.98	3.19	3.19	2.56	2.83	2.58	2.78
6	3.42	3.04	3.26	5.5	3.28	3.16	5.5	3.15	2.60	2.60	2.40	2.75
7	3.39	2.90	3.17	4.2	3.12	3.24	3.84	3.01	2.96	2.51	2.32	2.73
8	3.52	3.14	3.05	3.88	3.06	4.6	3.37	2.85	3.18	2.58	2.32	2.93
9	3.14	2.94	2.86	3.66	3.05	5.8	3.43	2.85	2.82	2.52	2.38	3.37
10	3.06	2.96	3.58	3.62	3.00	5.3	3.51	2.74	3.02	3.32	2.66	3.21
11	3.00	2.87	3.50	3.56	2.85	6.2	3.25	2.73	4.5	5.1	2.85	3.11
12	2.88	3.39	3.55	3.36	2.74	†8.6	3.19	2.62	5.5	4.5	2.94	3.02
13	2.86	2.94	3.58	3.27	2.73	4.2	3.14	2.67	3.62	3.76	2.76	2.93
14	2.76	3.06	3.40	6.2	2.66	3.85	3.07	2.55	4.0	3.91	2.64	2.76
15	3.29	2.65	3.24	5.7	2.75	4.2	3.01	2.48	4.7	5.3	2.59	3.17
16	2.88	2.71	*3.36	4.5	2.72	3.82	2.99	2.47	3.62	3.90	2.84	3.17
17	2.95	2.62	3.56	4.4	2.74	6.0	2.89	2.47	3.31	3.42	2.90	3.07
18	2.86	2.68	3.38	4.3	2.85	4.5	2.88	2.47	3.16	3.58	3.26	3.05
19	2.94	3.02	3.42	3.72	2.96	3.56	2.81	2.47	2.94	3.16	3.14	2.84
20	3.74	2.72	3.33	3.76	3.08	3.35	2.80	2.51	2.83	3.08	3.06	2.70
21	3.68	2.52	3.26	3.44	3.24	3.41	3.23	2.35	2.74	3.00	3.00	2.57
22	3.64	2.62	5.7	6.8	3.08	3.58	3.33	2.41	2.74	2.94	2.96	2.49
23	3.38	2.69	5.7	4.3	3.23	3.80	3.04	2.46	2.65	2.82	2.77	2.49
24	3.28	3.24	4.4	3.72	7.1	6.6	2.83	2.43	2.70	2.77	3.29	2.27
25	3.24	3.50	3.90	3.38	3.80	4.4	2.79	2.37	2.53	2.74	3.42	2.32
26	2.98	3.44	3.96	3.61	3.16	3.95	2.80	2.43	2.54	2.73	3.30	2.36
27	2.88	3.00	3.64	3.44	3.28	6.3	2.86	2.43	2.67	2.66	2.94	‡2.24
28	2.87	2.86	5.4	3.34	3.52	5.5	2.79	2.41	2.62	2.52	2.79	2.50
29	3.31	3.08	4.8	3.24	-------	4.2	2.82	2.73	2.64	2.56	2.46	2.56
30	3.02	3.60	4.2	6.1	-------	3.70	2.65	3.10	2.65	2.48	2.44	2.88
31	2.97	-------	4.3	5.2	-------	3.50	-------	2.83	-------	2.46	2.90	-------

NOTES—*Creek frozen December 16 to 22, 1916, and February 2 to 24, 1917, inclusive. †Maximum 9.8 feet at 2:30 p. m. ‡Minimum 2.19 feet. **A dam, the control for this gaging station, was damaged by ice March 1, 1917, and replaced July 31, 1917.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.4	3.9	3.4	2.9	4.0	4.0	3.0	3.1	3.6	2.8	3.0	3.2
2	2.5	3.7	3.5	2.9	3.9	3.6	3.0	3.2	3.3	2.8	2.6	2.8
3	2.6	3.6	3.3	2.9	3.9	3.7	3.1	3.0	3.0	2.6	2.7	2.4
4	2.5	3.6	3.3	2.8	3.8	3.4	3.2	3.0	3.0	2.5	2.9	2.9
5	2.1	3.4	3.2	2.8	3.5	3.5	3.2	3.2	3.0	2.6	2.4	2.8
6	2.4	3.4	3.1	2.8	3.6	3.8	3.0	3.2	3.0	2.7	2.3	2.4
7	2.8	3.4	3.0	2.7	3.7	4.4	3.0	3.0	3.3	2.6	2.4	2.2
8	2.4	3.3	3.0	2.8	3.8	3.9	3.0	3.0	3.3	2.5	2.3	2.6
9	2.3	3.3	*3.3	3.0	3.8	3.7	3.0	2.9	3.1	2.3	2.1	2.4
10	2.4	3.2	3.2	3.2	3.8	4.4	4.4	2.9	2.9	2.4	2.4	2.2
11	2.5	3.4	3.1	3.2	3.8	4.5	4.2	2.7	4.0	2.4	2.7	2.2
12	2.7	3.2	3.0	10.0	3.9	3.5	5.0	2.9	4.0	2.3	2.0	2.6
13	3.0	3.2	2.9	4.8	4.7	3.5	4.4	2.9	3.5	2.7	1.8	2.6
14	3.3	2.9	3.0	4.5	5.2	7.0	4.2	3.0	3.3	3.0	3.0	2.4
15	2.8	3.0	3.1	5.6	8.6	4.6	3.7	3.0	3.2	2.5	3.1	2.7
16	2.7	3.1	3.2	5.8	7.6	3.7	3.5	2.9	3.1	2.6	2.8	2.5
17	2.8	3.1	3.2	5.4	4.3	3.6	3.5	2.8	2.9	2.6	2.8	2.3
18	2.8	3.2	3.2	5.1	4.4	3.6	3.4	2.6	2.9	2.5	2.9	2.2
19	2.6	2.9	3.3	*5.0	5.3	3.4	3.3	2.8	2.8	2.7	2.4	2.4
20	3.1	2.9	3.2	4.8	†11.4	3.4	3.2	2.6	2.7	2.5	2.2	2.5
21	3.4	3.1	3.2	4.7	4.6	3.5	4.9	4.1	4.1	2.8	2.1	2.8
22	3.0	3.2	3.2	4.4	*4.6	3.5	4.6	5.4	4.4	2.4	2.3	3.4
23	3.1	3.4	3.4	4.3	5.6	3.4	3.9	3.6	3.2	2.3	2.1	2.9
24	3.7	3.4	3.1	4.2	4.9	3.3	3.5	3.3	2.9	2.3	‡2.1	2.9
25	3.9	3.4	3.4	4.1	4.0	3.3	3.4	2.2	2.9	2.3	2.5	2.9
26	3.5	3.0	3.5	4.1	10.8	3.2	3.3	3.2	2.8	2.3	2.8	2.9
27	3.4	2.9	3.4	4.0	4.3	3.2	3.2	3.0	2.8	2.4	2.4	2.6
28	4.0	3.0	3.2	4.0	4.0	3.0	3.3	8.6	2.7	2.3	2.3	2.2
29	3.6	2.9	3.0	4.1	-------	3.1	3.1	3.9	2.7	2.2	2.5	2.9
30	5.9	2.9	3.0	4.0	-------	3.1	3.1	3.5	2.9	2.1	3.1	2.9
31	4.6	-------	3.0	4.0	-------	3.1	-------	3.6	-------	3.7	2.2	-------

NOTES—*Gage heights affected by ice December 9, 1917 to January 12, 1918; January 19 to February 14 and February 22 to 25, 1918. †Maximum 12.7 feet from hydrograph at 8 a. m. ‡Minimum 1.70 feet.

DELAWARE BASIN—STATION NO. 15

BRANDYWINE CREEK AT CHADDS FORD

DESCRIPTION OF STATION

Location.—At two span, iron girder bridge of Pennsylvania Railroad at Chadds Ford, Delaware County.

Records Available.—Discharge measurements and gage heights from August 1, 1911, to September 30, 1918.

Drainage Area.—285 square miles.

Gage.—A standard chain gage, whose elevation of zero is 150.18 feet above mean sea level, is located on the upstream side of the bridge and is read twice daily by Newlin Arment.

Channel.—The natural right bank of the creek is low and flat but flood bank is high and steep; the left bank is high and steep, and the bed is composed of mud, stones and gravel.

Remarks.—Gage heights and discharge at low stages are affected by storage in a mill dam above.

Discharge Measurements of Brandywine Creek at Chadds Ford, Delaware County
(Drainage area 285 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq.ft.	Feet	Sec.-ft.	
23	April 4	Bowen & Weaver	333	1.82	381	0.2 & 0.8 method
24	July 26	Boehringer	279	1.27	224	0.2 & 0.8 method
25	Oct. 6	Wilson	244	0.98	133	0.2 & 0.8 method
	1918					
26	Mar. 16	Knight	337	1.78	413	0.2 & 0.8 method
27	April 12	Wilson	457	2.82	840	0.2 & 0.8 method
28	June 10	Hosmer & Landis	257	1.08	187	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Brandywine Creek at Chadds Ford, Delaware County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.22	1.08	1.10	1.20	1.5	1.32	2.1	1.5	1.31	1.38	1.18	1.49
2	1.13	1.07	1.05	1.23	1.5	1.37	2.1	1.5	1.41	1.39	1.28	1.24
3	0.99	1.06	1.03	1.19	1.48	1.4	2.1	1.5	1.29	1.6	1.24	1.13
4	0.96	1.04	1.14	1.20	*	1.37	1.8	1.5	1.25	1.5	1.14	1.04
5	0.98	1.03	1.19	1.7	-------	1.27	1.8	1.6	1.25	1.5	1.08	1.00
6	1.03	1.12	1.13	2.5	-------	1.3	1.9	1.5	1.31	1.48	1.12	0.99
7	1.05	1.10	1.09	1.6	-------	1.3	1.9	1.5	1.37	1.44	1.12	0.97
8	1.01	1.08	1.05	1.5	-------	2.9	1.8	1.5	1.6	1.44	1.12	1.9
9	1.02	1.15	1.23	1.6	-------	5.0	1.8	1.6	2.4	1.43	1.17	1.42
10	1.05	1.12	1.14	1.5	-------	4.6	1.9	1.6	2.7	1.5	1.14	1.12
11	1.07	1.08	1.10	1.49	-------	5.0	2.1	1.5	3.0	1.6	1.08	1.06
12	1.07	1.04	1.10	1.5	-------	5.2	1.9	1.47	4.9	1.7	1.10	1.02
13	1.05	1.10	1.07	1.42	-------	4.5	1.9	1.45	2.3	1.7	1.10	1.02
14	1.12	1.15	1.13	2.6	-------	2.6	1.9	1.41	2.3	1.6	1.08	1.04
15	1.09	1.11	1.14	2.0	-------	1.47	1.9	1.38	2.2	1.5	1.06	1.7
16	1.09	1.07	1.11	1.6	-------	1.40	1.9	1.36	2.1	1.49	1.06	1.18
17	1.14	1.05	1.20	1.44	-------	1.5	1.9	1.34	1.9	1.44	1.30	1.06
18	1.09	1.11	1.25	1.5	-------	1.37	1.8	1.32	2.0	1.46	1.06	1.07
19	1.7	1.01	1.31	1.46	-------	1.34	1.8	1.30	1.9	1.49	1.04	0.96
20	2.2	1.01	1.17	1.45	-------	1.34	1.7	1.31	1.9	1.44	1.03	1.01
21	1.37	1.01	1.45	1.49	-------	1.32	1.7	1.32	1.7	1.42	0.98	0.98
22	1.25	1.01	1.8	†6.5	1.28	1.30	1.7	1.36	1.7	1.41	1.03	0.94
23	1.25	1.06	1.5	1.9	1.48	1.34	1.7	1.6	1.6	1.38	0.94	0.93
24	1.15	1.46	1.25	1.7	4.0	1.8	1.7	1.4	1.6	1.33	1.32	0.93
25	1.17	1.06	1.27	1.6	3.5	2.6	1.7	1.36	1.5	1.28	1.13	0.96
26	1.22	1.06	1.25	1.5	1.8	2.3	1.7	1.29	1.46	1.27	1.08	1.02
27	1.22	1.05	1.29	1.49	1.7	2.6	1.6	1.24	1.47	1.28	1.10	1.00
28	1.17	1.04	1.23	1.44	1.33	2.7	1.49	1.24	1.41	1.28	1.05	1.06
29	1.09	1.08	1.21	1.46	-------	1.9	1.5	2.1	1.43	1.3	0.94	‡0.94
30	1.19	1.6	1.20	1.8	-------	1.8	1.5	1.35	1.4	1.29	1.03	0.94
31	1.12	-------	1.23	1.6	-------	2.0	-------	1.32	-------	1.28	1.12	-------

NOTES—*Creek frozen February 4 to 21, 1917, inclusive. †Maximum 8.3 feet at 8 p. m. estimated from hydrograph. ‡Minimum 0.89 feet at 5 p. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.91	1.7	1.44	1.17	1.33	1.9	1.32	1.8	1.24	1.02	1.03	0.94
2	0.90	1.5	1.30	1.06	1.26	1.7	1.36	1.6	1.14	0.92	0.76	0.92
3	0.94	1.40	1.18	0.96	1.16	1.6	1.28	1.46	1.14	0.92	‡0.75	0.84
4	0.98	1.34	1.22	0.99	1.18	1.6	1.36	1.42	1.06	0.90	0.78	0.74
5	1.00	1.32	1.18	1.06	*1.46	1.6	1.24	1.38	1.11	0.90	0.94	0.74
6	0.94	1.28	1.14	1.18	1.38	1.7	1.17	1.38	1.18	0.90	0.90	0.76
7	0.90	1.28	1.13	2.4	1.47	1.9	1.18	1.34	1.6	0.89	0.92	0.69
8	1.02	1.26	1.04	1.8	2.2	1.8	1.23	1.30	1.36	0.88	0.90	0.68
9	1.04	1.20	1.02	1.5	1.7	1.6	1.6	1.26	1.08	0.88	0.88	0.78
10	1.07	1.22	1.30	1.42	1.5	2.0	3.3	1.26	1.10	0.85	0.80	0.75
11	1.10	1.15	1.34	1.41	1.8	1.6	2.9	1.40	1.16	0.86	0.78	0.74
12	1.12	1.17	1.07	†8.0	3.8	1.6	2.6	1.29	1.21	0.96	0.92	0.79
13	1.30	1.16	1.10	3.5	7.1	1.7	2.4	1.31	1.35	1.32	0.93	0.82
14	1.04	1.16	1.19	2.1	6.2	3.0	2.0	1.46	1.16	0.96	0.74	0.71
15	1.10	1.18	1.28	4.9	7.4	2.4	1.8	1.32	1.28	0.96	0.88	0.66
16	1.05	1.21	1.22	2.5	4.8	1.7	1.6	1.32	1.10	0.88	0.86	0.79
17	0.96	1.14	1.18	1.9	2.1	1.6	1.6	1.20	1.12	0.88	0.80	0.80
18	1.02	1.10	1.10	1.6	1.6	1.6	1.6	1.13	1.06	0.92	0.71	1.02
19	1.00	1.18	1.14	1.16	2.3	1.6	1.5	1.14	1.08	0.92	0.84	1.06
20	1.8	1.15	1.15	1.5	7.0	1.5	1.42	1.16	1.00	0.92	0.86	0.94
21	1.23	1.15	1.20	1.46	3.0	1.49	2.4	1.16	1.00	0.91	0.77	1.30
22	1.12	1.24	1.22	1.32	1.9	1.7	2.7	1.5	1.6	0.79	0.84	1.00
23	1.03	1.36	1.11	1.6	1.9	1.5	1.8	1.34	1.26	0.80	0.88	0.88
24	3.9	1.22	1.16	1.5	1.8	1.42	1.6	1.26	1.15	0.76	0.74	0.86
25	2.5	1.12	1.24	1.18	1.9	1.5	1.6	1.22	1.09	0.80	0.65	0.88
26	1.46	1.14	1.33	1.13	5.2	1.46	1.5	1.20	1.06	0.76	0.78	0.86
27	1.34	1.09	1.21	1.16	2.5	1.38	1.47	1.32	1.04	0.78	0.76	0.86
28	2.3	1.16	1.19	1.18	1.9	1.36	1.42	2.8	1.02	0.74	0.76	0.73
29	1.6	1.11	1.17	1.38	-------	1.36	1.48	1.6	1.04	0.76	0.86	0.68
30	3.2	1.18	1.23	1.43	-------	1.26	1.46	1.29	1.00	0.88	1.01	0.83
31	2.9	-------	1.19	1.20	-------	1.28	-------	1.28	-------	1.18	0.74	-------

NOTES—*Gage heights affected by ice February 5 to 11, 1918. †Maximum 11.8 feet from hydrograph at 11 a. m. ‡Minimum 0.48 foot.

Daily Discharge, in second-feet, of Brandywine Creek at Chadds Ford, Delaware County, for the year ending September 30, 1917.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	189	156	160	184	264	215	482	264	213	231	179	261
2	167	153	149	192	264	228	482	264	239	233	205	194
3	136	151	145	182	258	236	482	264	207	294	194	167
4	130	147	170	184	*236	228	364	264	197	264	170	147
5	134	145	182	328	210	202	364	294	197	264	156	138
6	145	165	167	660	184	210	402	264	213	258	165	136
7	149	160	158	294	184	210	402	264	228	247	165	132
8	140	156	149	264	210	852	364	264	294	247	165	402
9	142	172	192	294	210	2,200	364	294	612	244	177	242
10	149	165	170	264	184	1,920	402	294	756	264	170	165
11	153	156	160	261	160	2,200	482	264	900	294	156	151
12	153	147	160	264	138	2,360	402	256	2,130	328	160	142
13	149	160	153	242	109	1,850	402	250	567	328	160	142
14	165	172	167	708	100	708	402	239	567	294	156	147
15	158	162	170	442	118	256	402	231	522	264	151	328
16	158	153	162	294	138	236	402	226	482	261	151	179
17	170	149	184	247	138	264	402	220	402	247	210	151
18	158	162	197	264	138	228	364	215	442	253	151	153
19	328	140	213	253	149	220	364	210	402	261	147	130
20	522	140	177	250	172	220	328	213	402	247	145	140
21	228	140	250	261	184	215	328	215	328	242	134	134
22	197	140	364	†3,560	205	210	328	226	328	239	145	126
23	197	151	264	402	258	220	328	294	294	231	126	124
24	172	253	197	328	1,500	364	328	226	294	218	215	124
25	177	151	202	294	1,180	708	328	226	264	205	167	130
26	189	151	197	264	364	567	328	207	253	202	156	142
27	189	149	207	261	328	708	294	194	256	205	160	138
28	177	147	192	247	218	756	261	194	239	205	149	151
29	158	156	187	253	-------	402	264	482	244	210	126	‡126
30	182	294	184	364	-------	364	264	223	236	207	145	126
31	165	-------	192	294	-------	442	-------	215	-------	205	165	-------

NOTES—*Creek frozen February 4 to 21, 1917, inclusive, and discharge estimated from climatological data. †Maximum=6,250 second-feet. ‡Minimum=116 second-feet.

Estimated Monthly Discharge of Brandywine Creek at Chadds Ford, Delaware County
(Drainage area 285 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-17					
October	522	130	181	0.64	0.74
November	294	140	161	0.56	0.62
December	364	145	188	0.66	0.76
January	†3,560	182	406	1.42	1.64
February	1,500	-------	279	0.98	1.02
March	2,360	202	645	2.26	2.61
April	482	261	370	1.30	1.45
May	482	194	251	0.88	1.02
June	2,130	197	424	1.49	1.66
July	328	202	248	0.87	1.00
August	215	126	162	0.57	0.66
September	402	‡124	166	0.58	0.65
The year	3,560	-------	290	1.02	13.83

NOTES—Creek frozen February 4 to 21, 1917, inclusive, and discharge estimated from climatological data. †Maximum 6,250 second-feet January 22, 1917. ‡Minimum 116 second-feet September 29, 1917.

SUSQUEHANNA BASIN

SUSQUEHANNA BASIN—STATION NO. 1

NORTH BRANCH SUSQUEHANNA RIVER AT BINGHAMTON, N. Y.

DESCRIPTION OF STATION

Location.—At four span, steel, through truss, highway bridge at Washington Street, Binghampton, N. Y.

Records Available.—Discharge complete from July 31, 1901, to December 31, 1912, and gage heights from January 23, 1915, to September 30, 1918. For other records on this river see North Branch Susquehanna River at Towanda, Wilkes-Barre and Danville.

Drainage Area.—2,400 square miles.

Gage.—A standard chain gage, whose elevation of zero is 821.49 feet above mean sea level, is located on the upstream side of the bridge and is read twice daily by A. L. Coleman.

Channel.—Both banks are high and not subject to overflow, except in extreme stages, and the bed is composed of gravel and small stones.

Daily Mean Gage Heights, in feet, of North Branch Susquehanna River at Binghamton, Broome County, N. Y., for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	3.2	2.6	5.0	3.0	3.2	5.4	7.2	3.0	4.2	6.2	3.0	2.9
2	3.2	2.7	4.4	3.0	3.4	4.8	8.8	3.3	4.8	6.5	2.8	2.8
3	3.2	2.8	4.1	2.9	3.5	4.0	9.6	3.2	4.6	6.6	2.8	2.8
4	3.2	2.8	3.7	3.0	3.4	3.4	7.9	3.1	3.8	5.4	2.8	2.7
5	2.7	3.0	3.6	3.2	3.2	3.3	6.6	3.1	3.4	4.7	2.8	2.6
6	2.5	2.7	3.8	4.6	3.3	3.2	6.6	3.4	6.4	4.0	2.8	2.5
7	2.6	2.9	3.8	4.6	3.1	3.0	6.8	5.3	7.1	3.8	2.6	2.5
8	2.6	2.9	3.6	4.4	2.8	2.8	6.2	5.2	7.1	3.6	2.5	2.5
9	2.5	2.8	3.6	3.9	2.8	2.9	5.7	5.0	7.1	3.4	5.9	2.5
10	2.5	2.8	3.6	3.8	3.3	3.1	5.0	4.8	7.6	3.3	5.9	2.5
11	2.4	2.7	3.5	4.6	3.2	3.7	4.5	4.2	8.3	3.4	4.6	2.5
12	2.4	2.7	3.4	5.4	3.1	4.8	4.1	4.0	8.2	3.5	3.8	2.5
13	2.4	2.6	3.4	5.8	3.0	5.7	3.8	3.8	8.0	4.1	3.0	2.4
14	2.4	2.6	3.2	5.5	2.6	5.4	4.1	3.6	7.3	3.6	3.1	2.3
15	2.5	3.0	3.2	5.5	2.7	4.8	4.0	3.4	6.2	4.2	3.1	2.3
16	2.6	3.0	3.0	5.4	2.7	4.1	3.8	3.3	6.0	4.7	3.0	2.3
17	2.5	3.1	3.1	4.9	2.6	4.0	3.6	3.2	5.3	4.6	3.4	2.3
18	2.4	3.0	3.2	4.1	2.7	3.9	3.4	3.2	4.9	4.4	**3.2	2.3
19	2.4	2.9	3.2	4.1	2.7	3.8	3.4	3.1	4.9	4.4	3.0	2.2
20	2.8	2.9	3.3	3.8	2.6	3.7	3.4	3.0	5.6	4.7	2.7	2.2
21	3.8	2.9	3.4	3.5	2.7	3.6	3.6	3.0	8.1	5.1	2.6	2.2
22	3.8	2.8	3.4	3.2	2.7	3.8	3.6	3.0	6.4	4.4	2.5	2.2
23	3.4	3.0	3.4	3.5	2.5	4.6	3.6	3.2	5.1	3.5	2.5	2.2
24	3.0	3.7	3.4	3.2	2.3	8.6	3.4	3.1	5.0	3.4	3.5	‡2.1
25	2.9	4.9	3.6	3.0	2.5	12.7	3.3	3.0	5.9	3.3	4.1	2.1
26	2.8	4.2	3.4	3.4	2.7	12.0	3.1	3.0	5.3	3.4	3.4	2.1
27	2.7	3.3	3.4	4.0	3.4	†12.6	3.1	3.1	7.7	3.3	2.7	2.1
28	2.7	3.3	3.2	4.0	4.5	13.2	3.1	3.1	8.3	3.2	2.6	2.1
29	2.6	3.4	3.3	3.5	-------	11.4	3.1	4.7	6.4	3.0	2.5	2.1
30	2.6	4.4	3.2	3.0	-------	8.7	3.0	4.4	6.5	3.0	2.8	2.1
31	2.5	-------	3.2	3.1	-------	6.7	-------	4.8	-------	3.3	3.0	-------

NOTES—†Maximum 13.9 feet at 2 a. m. estimated from hydrograph. ‡Minimum 2.1 feet September 24 to 30, 1917 inclusive. **Observations August 18 to September 30, 1917 from U. S. Weather Bureau records.

Daily Mean Gage Heights, in feet, of North Branch Susquehanna River at Binghamton, Broome County, N. Y., for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.1	10.2	2.6	2.2	2.3	12.0	4.1	4.3	4.4	2.7	2.1	2.2
2	2.1	7.2	2.8	2.2	2.3	11.0	-------	4.4	3.8	2.9	2.0	3.2
3	2.1	5.8	3.2	2.2	2.3	9.0	-------	4.1	3.4	3.2	2.1	2.6
4	2.1	-------	2.9	2.3	2.3	7.3	-------	3.8	3.3	3.0	2.1	2.3
5	2.1	4.5	2.8	2.6	2.4	5.8	-------	3.5	3.1	2.8	2.0	2.2
6	2.2	4.1	2.7	2.0	2.4	6.2	4.0	3.6	2.9	2.7	2.1	2.2
7	2.4	3.9	2.8	2.2	2.2	8.2	3.8	3.4	2.9	2.6	2.0	2.2
8	2.4	3.8	2.7	2.2	2.3	7.4	3.6	3.2	3.8	2.5	2.0	2.0
9	2.4	3.4	-------	2.2	2.2	6.1	4.4	3.1	3.6	2.5	2.0	2.1
10	2.4	3.3	*3.4	2.3	-------	6.1	5.4	3.0	3.2	2.5	2.0	2.2
11	2.4	3.2	2.9	2.2	2.2	7.8	5.0	3.0	3.0	2.5	2.1	2.2
12	2.3	3.2	2.7	2.1	2.1	6.6	4.7	3.0	4.1	2.8	2.0	2.1
13	2.6	3.1	2.6	-------	2.4	6.4	4.6	4.4	4.6	3.1	2.1	2.2
14	3.0	3.0	2.5	2.9	2.8	9.8	5.3	7.5	4.0	-------	2.2	2.2
15	2.9	2.9	3.0	2.7	4.8	8.6	7.4	6.2	3.4	2.6	2.2	2.2
16	2.8	2.9	2.6	2.8	5.4	7.1	7.6	5.0	3.2	2.7	2.2	2.2
17	3.0	2.9	2.5	2.6	5.8	6.2	6.4	4.2	3.1	2.8	2.1	2.3
18	2.9	2.8	2.5	2.6	5.1	7.4	7.0	3.8	3.0	2.9	2.1	2.2
19	2.7	2.8	2.5	2.5	4.5	7.8	6.6	3.6	2.7	2.8	2.0	2.3
20	3.7	2.7	2.5	-------	9.5	8.7	5.6	3.4	2.6	2.8	2.0	2.5
21	4.4	2.8	2.4	2.8	10.9	9.2	-------	4.9	2.5	-------	2.0	3.3
22	3.8	2.7	2.4	2.4	10.1	9.6	6.0	4.5	3.4	3.0	2.0	3.0
23	3.4	3.2	2.3	2.4	7.6	9.3	6.7	4.5	3.5	2.9	2.0	2.9
24	3.2	3.5	2.3	2.6	6.1	-------	6.0	4.2	3.4	2.9	2.0	2.7
25	5.9	3.1	2.4	2.4	5.3	6.6	5.6	3.8	3.1	2.8	2.0	2.6
26	5.2	2.9	2.8	2.6	9.5	6.0	5.0	-------	2.9	2.5	†1.8	4.0
27	4.4	2.8	2.5	-------	11.3	5.4	4.4	5.3	2.8	2.2	†1.8	5.0
28	4.7	2.7	2.3	2.7	10.9	4.8	4.1	5.2	2.7	2.2	†1.8	4.8
29	5.0	2.7	2.4	2.3	-------	4.2	3.8	4.3	2.6	2.1	2.0	3.9
30	10.0	2.6	2.2	2.3	-------	4.2	3.9	5.4	2.6	2.2	2.0	3.5
31	†12.0	-------	2.2	2.3	-------	4.1	-------	4.7	-------	2.1	2.0	-------

NOTES—*Gage heights affected by ice December 10, 1917 to March 2, 1918. †Maximum 12.5 feet at 1:00 a. m. ‡Minimum 1.8 feet.

SUSQUEHANNA BASIN—STATION NO. 2

NORTH BRANCH SUSQUEHANNA RIVER AT TOWANDA

DESCRIPTION OF STATION

Location.—At four span, steel, through truss, highway bridge at Towanda, Bradford County.

Records Available.—Discharge measurements and gage heights from January 29, 1914, to September 30, 1918. For other records on this river see North Branch Susquehanna River at Binghamton, N. Y., Wilkes-Barre and Danville.

Drainage Area.—7,770 square miles.

Gage.—A standard chain gage, whose elevation of zero is 693.4 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by Hiram E. Bull.

Channel.—Both banks are high and not subject to overflow, and the bed is composed of rock and gravel.

Remarks.—The U. S. Weather Bureau has observed gage heights at this station since October 1, 1892.

Discharge Measurements of North Branch Susquehanna River at Towanda, Bradford County
(Drainage area 7,770 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
15	April 12	Brown	7,396	4.16	14,797	0.2 & 0.8 method
16	April 23	Brown	6,551	3.18	9,489	0.6 method
17	July 11	Brown & Heagy	6,883	3.81	12,175	Surface method
18	Sept. 6	Brown & Warlow	5,953	2.58	6,490	0.2 & 0.8 method
19	Sept. 26	Wilson	4,872	1.33	2,279	0.2 & 0.8 method
	1918					
20	Sept. 17	Hosmer & Shade	2,612	1.10	1,970	0.2 & 0.8 & 0.6 methods

Daily Mean Gage Heights, in feet, of North Branch Susquehanna River at Towanda, Bradford County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	3.1	1.6	3.8	4.0	3.0	4.4	6.2	2.4	4.4	5.4	2.9	3.4
2	2.7	1.7	3.7	4.6	*3.7	4.5	7.6	2.6	3.8	6.4	2.5	3.5
3	2.3	1.9	3.3	4.5	5.2	3.9	8.7	2.7	4.2	8.2	2.6	4.0
4	2.0	2.0	3.1	4.6	4.9	3.3	7.8	2.6	3.8	6.1	2.3	3.4
5	1.8	1.9	2.9	4.3	4.8	2.7	6.4	2.6	3.3	5.2	2.3	2.8
6	1.7	1.9	2.9	4.6	4.8	2.5	5.6	4.1	3.2	4.3	2.1	2.6
7	1.5	2.0	3.0	4.8	4.9	2.4	6.9	5.2	6.6	4.0	2.0	2.5
8	1.4	2.1	2.9	4.3	5.0	2.5	6.7	4.9	8.6	3.5	2.0	2.5
9	1.3	2.0	2.7	3.7	4.8	2.5	5.8	4.9	8.1	3.4	9.0	2.9
10	1.2	1.9	2.6	3.3	4.4	2.5	4.9	4.8	6.8	3.7	7.1	2.7
11	1.2	2.0	2.8	3.7	4.2	2.7	4.4	4.3	7.0	3.8	5.0	2.5
12	1.2	2.1	2.8	2.0	4.1	7.5	4.2	3.9	7.6	3.7	3.7	2.3
13	1.1	2.2	2.6	2.0	4.0	6.2	4.2	3.6	7.4	4.0	3.1	2.1
14	‡1.1	2.1	2.4	3.3	4.1	5.4	4.1	3.4	6.4	3.9	4.6	2.0
15	1.2	2.1	2.2	5.0	3.9	4.7	3.8	3.1	5.7	4.3	7.1	1.9
16	1.5	2.5	2.1	5.2	3.8	4.0	3.6	3.0	5.5	4.3	5.0	1.8
17	1.5	2.5	*2.7	4.6	3.7	4.3	3.4	2.7	5.2	4.0	5.0	1.7
18	1.4	2.4	3.8	4.1	3.7	4.2	3.2	2.7	4.3	3.8	3.8	1.6
19	1.3	2.2	3.7	3.7	3.6	3.9	3.1	2.6	4.2	3.8	3.1	1.6
20	1.4	2.2	3.5	3.3	3.8	3.2	2.9	2.5	5.3	4.2	2.6	1.7
21	3.0	2.2	3.6	3.1	3.8	3.6	3.1	2.5	7.1	4.7	2.4	2.1
22	3.6	2.1	3.1	3.2	3.7	3.9	3.3	2.6	6.4	4.6	2.3	1.9
23	3.3	2.1	3.6	2.7	3.6	4.4	3.2	2.6	5.0	3.9	2.2	1.6
24	2.7	2.2	4.0	2.5	3.5	7.0	3.0	2.9	5.8	3.4	4.4	1.5
25	2.4	3.5	3.9	2.6	3.3	10.1	2.8	2.8	6.9	3.1	5.0	1.4
26	2.2	3.6	4.2	2.2	3.5	10.5	2.7	2.7	5.7	2.9	3.9	1.3
27	2.1	3.0	4.1	*3.2	4.3	10.4	2.6	2.6	6.7	3.1	3.1	1.3
28	1.9	2.7	3.5	4.2	6.6	†12.0	2.6	2.7	8.2	2.9	2.6	1.3
29	1.8	2.7	3.2	3.8	-------	10.8	2.6	6.2	6.5	2.5	2.9	1.2
30	1.7	3.0	3.1	3.8	-------	8.6	2.5	7.6	6.1	5.0	3.0	1.2
31	1.7	-------	3.2	3.1	-------	6.7	-------	5.7	-------	3.3	3.8	-------

NOTES—*River frozen December 17, 1916, to January 6, 1917; January 27 to 31, and February 2 to 28, 1917, inclusive. †Maximum 12.3 feet at 9 p. m. estimated from hydrograph. ‡Minimum 1.11 feet at 6 p. m.

Daily Mean Gage Heights, in feet, of North Branch Susquehanna River at Towanda, Bradford County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.2	10.0	2.3	2.6	2.9	13.2	3.9	3.9	4.6	1.9	1.1	0.7
2	1.3	7.8	2.5	2.6	2.8	12.6	3.9	4.2	4.1	2.2	1.0	0.7
3	1.3	5.8	2.6	2.6	2.8	9.4	4.0	4.0	3.5	2.3	1.0	1.2
4	1.3	5.1	2.6	2.6	2.8	7.3	4.6	3.6	3.1	2.3	1.0	1.3
5	1.3	4.4	2.5	2.6	2.8	6.0	4.6	3.5	2.9	2.1	1.0	1.0
6	1.7	3.9	2.4	2.6	2.8	5.8	4.0	3.4	2.7	2.1	1.0	1.0
7	1.8	3.7	2.2	2.6	2.8	7.4	3.6	3.2	2.9	1.9	1.0	1.0
8	1.9	3.5	1.8	2.6	2.8	6.7	3.4	3.0	3.8	1.7	1.0	1.0
9	1.8	3.3	1.3	2.6	2.9	6.1	4.2	2.9	3.5	1.6	1.0	1.0
10	1.9	3.1	*1.5	2.6	2.9	6.1	5.2	2.8	3.0	1.6	1.1	0.9
11	1.9	3.0	2.4	2.6	2.8	6.6	5.0	2.7	2.7	1.6	1.2	0.8
12	1.8	2.8	2.6	2.6	2.7	5.5	4.8	2.7	3.1	2.1	1.3	0.8
13	1.8	2.8	2.6	2.6	6.4	6.3	4.6	3.4	4.5	2.6	1.4	0.9
14	2.9	2.6	2.6	2.6	6.2	12.5	5.4	6.1	3.9	2.8	1.2	0.9
15	2.7	2.5	2.6	2.6	6.5	†15.8	9.6	5.9	2.8	2.4	1.3	1.1
16	2.4	2.4	2.6	2.6	6.9	8.3	11.5	4.6	2.9	2.2	1.3	1.1
17	2.8	2.4	2.6	3.1	5.2	7.0	9.6	4.0	2.7	2.1	1.2	1.1
18	2.6	2.4	2.6	3.7	4.8	6.8	9.4	3.5	2.4	1.9	1.0	1.4
19	2.4	2.3	2.6	3.7	4.4	7.4	7.8	3.2	2.3	1.9	1.0	2.1
20	4.6	2.2	2.6	3.7	9.2	7.9	6.3	3.0	2.1	1.9	0.8	2.4
21	5.2	2.2	2.6	3.7	11.3	8.4	5.4	4.3	1.9	1.7	0.8	4.0
22	4.2	2.3	2.6	3.7	8.8	8.6	5.7	4.7	2.5	1.6	0.8	3.4
23	3.6	2.4	2.6	3.7	7.6	8.3	6.3	4.4	3.7	1.5	0.8	2.9
24	4.3	3.2	2.6	3.6	6.1	7.4	6.1	4.6	3.4	1.4	0.7	2.5
25	9.3	3.0	2.6	3.6	5.5	6.4	5.5	4.0	3.0	1.7	0.7	2.2
26	7.7	2.5	2.6	3.6	9.2	5.5	4.8	4.2	2.6	1.7	0.7	2.6
27	6.2	2.3	2.6	3.6	10.4	5.0	4.4	5.0	2.3	1.5	0.6	4.4
28	6.7	2.2	2.6	3.6	9.7	4.5	4.1	5.5	2.1	1.3	‡0.6	4.2
29	6.5	2.0	2.6	3.1	-------	4.2	3.8	4.6	1.9	1.2	0.7	3.6
30	8.4	2.2	2.6	2.9	-------	4.0	3.6	7.2	1.8	1.2	‡0.6	3.1
31	11.9	-------	2.6	2.8	-------	3.9	-------	5.8	-------	1.1	0.7	-------

NOTES—*Gage heights affected by ice December 10, 1917 to February 13, 1918. †Maximum 16.9 feet 8:00 to 11:00 a. m. ‡Minimum 0.57 feet

SUSQUEHANNA BASIN—STATION NO. 3

TOWANDA CREEK NEAR MONROETON

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge at Monroeton, Bradford County.

Records Available.—Discharge complete from January 30, 1914, to September 30, 1916, and discharge measurements and gage heights October 1, 1916, to September 30, 1918.

Drainage Area.—218 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the downstream side of the bridge and is read twice daily by Leon D. Pepper.

Channel.—The right bank is high and steep, the left bank is low but not subject to overflow, and the bed is composed of coarse gravel. The thread of the current passes under the bridge at an angle.

Discharge Measurements of Towanda Creek near Monroeton, Bradford County
(Drainage area 218 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
12	April 13	Brown	282	2.84	378	0.6 method.
13	April 24	Brown	222	2.38	137	0.2 & 0.8 & 0.6 method.
14	July 10	Brown and Heagy	190	2.24	81	0.2 & 0.8 & 0.6 method.
	1918					
15	Sept. 18	Hosmer and Shade	260	2.74	232	0.6 method.

Daily Mean Gage Heights, in feet, of Towanda Creek near Monroeton, Bradford County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-17												
1	2.77	2.51	2.78	2.43	2.55	2.75	3.19	2.34	2.84	2.45	2.15	2.86
2	2.60	2.52	2.70	2.43	2.45	2.64	3.25	2.33	2.74	2.63	2.16	2.86
3	2.52	2.47	2.65	2.40	*2.31	2.62	3.31	2.31	3.04	2.51	2.17	2.78
4	2.48	2.46	2.64	2.47	2.39	2.54	3.00	2.29	2.76	2.40	2.08	2.64
5	2.38	2.46	2.61	2.77	2.39	2.50	2.92	2.49	2.66	2.33	2.06	2.53
6	2.34	2.46	2.59	3.44	2.50	2.58	3.42	2.82	2.66	2.28	‡2.08	2.47
7	2.33	2.43	2.56	3.07	2.51	2.58	3.55	2.63	3.72	2.25	2.26	2.45
8	2.32	2.42	2.54	2.87	2.52	2.43	3.29	2.75	3.33	2.21	2.79	2.45
9	2.28	2.37	2.54	2.75	2.47	2.50	3.05	2.77	3.04	2.24	†6.22	2.44
10	2.28	2.48	2.52	2.77	2.47	2 73	2.89	2.76	2.98	2.25	3.61	2.40
11	2.28	2.48	2.54	2.85	2.47	3.57	2.84	2.65	3.35	2.29	3.14	2.35
12	2.25	2.48	2.55	*2.81	2.59	3.94	2.87	2.61	3.00	2.26	2.84	2.31
13	2.26	2.47	2.55	2.80	2.59	3.06	2.83	2.58	2.78	2.22	2.68	2.27
14	2.32	2.48	2.58	4.99	2.55	2.98	2.75	2.49	2.84	2.19	2.88	2.26
15	2.36	2.46	*2.40	3.27	2.58	2.83	2.69	2.44	2.76	2.16	3.04	2.23
16	2.31	2.44	2.38	3.14	2.56	2.86	2.64	2.41	2.84	2.15	2.96	2.19
17	2.30	2.42	2.40	2.89	2.57	3.20	2.57	2.47	2.68	2.12	4.22	2.17
18	2.32	2.42	2.44	2.81	2.50	2.88	2.49	2.47	2.56	2.16	3.18	2.16
19	2.33	2.41	2.46	2.83	2.53	2.71	2.49	2.47	2.66	2.16	2.86	2.16
20	2.90	2.38	2.42	2.75	2.58	2.60	2.55	2.40	2.58	2.29	2.69	2.15
21	3.57	2.37	2.48	2.63	2.57	2.76	2.50	2.37	2.48	2.24	2.69	2.12
22	2.97	2.36	2.53	2.66	2.58	2.65	2.47	2.37	2.40	3.04	2.54	2.12
23	2.84	2.42	2.65	2.63	2.47	2.90	2.42	2.47	2.58	2.61	2.50	2.10
24	2.72	3.18	2.59	2.52	2.49	3.58	2.59	2.47	3.52	2.46	3.81	2.09
25	2.68	2.90	2.50	2.49	2.63	3.46	2.37	2.42	2.86	2.59	3.18	2.08
26	2.63	2.74	2.45	2.53	2.59	3.44	2.37	2.38	2.68	2.44	2.85	2.07
27	2.56	2.64	2.44	2.49	3.71	3.96	2.37	2.39	2.83	2.34	2.68	2.07
28	2.52	2.62	2.44	2.51	3.14	3.99	2.35	2.62	2.61	2.26	2.61	2.06
29	2.52	2.63	2.43	2.49	-------	3.46	2.33	4.02	2.56	2.24	2.68	2.06
30	2.44	2.90	2.36	2.55	-------	3.14	2.35	3.35	2.52	2.38	3.32	2.07
31	2.46	-------	2.42	2.63	-------	3.04	-------	3.06	-------	2.24	3.16	-------

NOTES—*Creek frozen December 15, 1916, to January 5, 1917; January 12 to 14, and February 3 to 27, 1917, inclusive. †Maximum 9.50 feet at 3.30a. m. estimated from hydrograph. ‡Minimum 2.05 feet at 7 a. m.

Daily Mean Gage Heights, in feet, of Towanda Creek near Monroeton, Bradford County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-18												
1	2.08	3.46	2.28	2.62	2.81	5.58	2.74	3.06	3.06	2.64	2.08	2.21
2	2.08	3.18	2.26	2.63	2.80	3.84	2.74	2.94	2.86	2.36	2.02	2.08
3	2.06	3.00	2.26	2.63	2.80	3.54	2.76	2.84	2.71	2.18	1.94	2.00
4	2.08	2.89	2.26	2.70	2.80	3.24	2.91	2.82	2.62	2.30	1.94	1.97
5	2.17	2.78	2.29	2.74	2.82	3.11	2.78	2.77	2.55	2.17	2.04	1.94
6	2.26	2.67	2.22	2.64	2.81	3.64	2.75	2.76	2.60	2.14	2.21	2.26
7	2.19	2.66	2.22	2.54	2.79	3.46	2.71	2.70	2.76	2.10	2.06	2.24
8	2.15	2.58	2.24	2.52	2.78	3.16	2.68	2.65	2.62	2.06	1.99	2.11
9	2.16	2.55	*2.26	2.64	2.76	3.08	3.25	2.57	2.44	2.06	2.48	2.06
10	2.16	2.52	2.38	2.62	2.74	3.84	3.19	2.54	2 41	2.05	2.34	1.96
11	2.14	2.51	2.42	2.61	2.70	3.25	3.14	2.55	2.40	2.01	2.72	1.95
12	2.16	2.46	2.45	2.76	2.82	3.14	3.17	2.50	2.45	2.02	2.39	1.95
13	2.44	2.46	2.46	3.01	5.02	3.40	3.13	4.47	2.44	2.02	2.26	2.34
14	2.34	2.41	2.51	3.24	4.11	†7.46	3.68	4.28	2.35	2.15	2.30	2.46
15	2.25	2.40	2.57	3.29	4.78	4.81	3.62	3.52	2.34	2.09	2.36	2.29
16	2.21	2.37	2.56	3.24	4.71	3.85	5.11	3.17	2.26	2.05	2.24	2.22
17	2.20	2.36	2.56	3.30	3.38	3.58	5.18	3.00	2.22	2.01	2.15	2.28
18	2.16	2.36	2.53	3.26	3.54	3.52	4.38	2.84	2.17	1.97	2.08	2.76
19	2.21	2.34	2.50	3.24	3.28	3.49	3.78	2.74	2.15	1.95	2.04	2.89
20	3.43	2.31	2.46	3.16	5.34	3.60	3.41	2.67	2.10	1.92	1.98	3.18
21	2.83	2.34	2.46	3.08	3.68	3.61	3.46	3.76	2.11	1.88	1.96	3.50
22	2.70	2.36	2.49	3.06	5.54	3.57	3.63	3.06	2.59	1.87	1.95	2.95
23	2.38	2.48	2.43	3.06	3.36	3.48	3.42	3.65	2.48	1.87	1.90	2.72
24	4.21	2.48	2.50	3.06	3.08	3.19	3.48	3.06	2.34	1.84	1.86	2.61
25	4.28	2.46	2.52	3.04	3.02	3.12	3 16	2.95	2.26	2.03	1.85	2.54
26	3.60	2.47	2.52	3.00	5.91	3.02	3.94	3.09	2.20	2.05	1.84	2.92
27	3.84	2.36	2.50	2.96	3.92	2.94	2.94	2.96	2.14	1.95	‡1.82	2.82
28	4.21	2.31	2.44	2.96	3.51	2.86	2.88	3.18	2.08	1.87	‡1.84	2.62
29	3.60	2.28	2.47	2.94	-------	2.80	2.75	2.98	2.08	‡1.82	2.00	2.52
30	5.01	2.31	2.48	2.86	-------	2.78	2.97	3.82	2.11	2.36	2.04	2.46
31	3.98	-------	2.53	2.86	-------	2.76	------	3.32	-------	2.24	2.03	-------

NOTES—*Gage heights affected by ice December 9, 1917, to February 15, 1918. †Maximum 8.0 feet at noon. ‡Minimum 1.81 feet.

SUSQUEHANNA BASIN—STATION NO. 4

MEHOOPANY CREEK NEAR MEHOOPANY

DESCRIPTION OF STATION

Location.—At two span, steel, through truss, highway bridge, the second above the mouth of the creek near Mehoopany, Wyoming County.

Records Available.—Discharge measurements and gage heights from January 29, 1914, to September 30, 1918.

Drainage Area.—129 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the downstream side of the bridge and is read twice daily by E. Veargason.

Channel.—The right bank is high and steep, the left bank is low but not subject to overflow, and the bed is composed of coarse gravel.

Discharge Measurements of Mehoopany Creek near Mehoopany, Wyoming County
(Drainage area 129 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
15	Mar. 22	Brown & Heagy	86	1.49	140	0.2 & 0.8 method
16	April 17	Brown	93	1.58	164	0.2 & 0.8 method
17	July 9	Brown & Heagy	77	1.30	102	0.2 & 0.8 method
	1918					
18	Sept. 16	Hosmer & Shade	71	1.10	65	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Mehoopany Creek near Mehoopany, Wyoming County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.45	1.15	1.91	1.30	1.26	1.67	2.27	1.21	1.81	1.49	1.02	1.23
2	1.23	1.12	1.71	1.29	1.23	1.49	2.34	1.17	1.78	1.40	1.24	1.16
3	1.07	1.13	1.61	1.37	1.21	1.34	2.24	1.12	1.70	1.45	1.12	1.14
4	0.95	1.19	1.55	1.43	1.96	1.19	1.97	1.19	1.58	1.43	1.00	1.06
5	0.86	1.12	1.45	1.59	1.91	1.09	2.03	1.45	1.48	1.40	0.96	0.96
6	0.83	1.05	1.45	2.44	1.86	1.27	2.09	1.71	1.52	1.26	0.88	0.97
7	0.93	1.11	1.31	2.19	1.79	1.41	2.34	1.69	1.74	1.36	0.82	0.93
8	0.86	1.09	1.24	1.86	1.63	1.29	2.27	1.95	1.58	1.33	0.81	0.91
9	0.90	1.09	1.24	1.79	1.49	1.41	2.11	1.97	1.47	1.32	1.50	0.94
10	0.90	1.07	1.31	1.73	1.46	1.49	1.97	1.79	1.54	1.37	2.38	0.89
11	0.86	1.05	1.23	1.59	1.23	2.33	1.97	1.71	1.64	1.34	1.66	0.92
12	0.77	1.12	1.24	*1.33	1.29	2.81	1.87	1.62	1.66	1.25	1.46	0.88
13	0.71	1.13	1.11	1.43	1.53	2.04	1.79	1.55	1.47	1.20	1.30	0.90
14	0.97	1.13	1.03	3.93	1.52	1.87	1.71	1.45	1.45	1.12	2.83	0.70
15	1.05	1.15	*1.21	2.63	1.51	1.61	1.63	1.36	1.35	1.12	2.20	0.72
16	0.97	1.15	1.27	2.36	1.53	1.61	1.59	1.29	1.81	1 09	1.80	0.67
17	0.97	1.15	1.31	1.93	1.65	1.69	1.59	1.49	1.64	1.08	1.68	0.64
18	1.07	0.95	1.31	1.83	1.70	1.67	1.50	1.39	1.48	1.10	1.48	0.64
19	1.35	0.87	1.38	1.73	1.73	1.41	1.45	1.29	1.38	1.53	1.30	0.60
20	3.25	0.91	1.29	1.69	1.76	1.45	1.50	1.26	1.38	2.98	1.24	0.58
21	3.00	0.87	1.38	1.63	1.79	1.50	1.51	1.21	1.45	2.46	1.16	0.62
22	2.35	0.91	1.81	1.63	1.73	1.48	1.43	1.18	1.62	1.88	1.07	0.70
23	2.07	1.08	2.21	1.53	1.73	1.67	1.43	1.23	1.58	1.43	1.09	‡0.54
24	1.60	1.98	1.95	1.43	1.96	2.71	1.40	1.25	2.44	1.30	2.28	0.50
25	1.30	1.78	1.91	1.27	1.77	2.59	1.35	1.18	2.01	1.24	1.78	0.52
26	1.25	1.48	1.75	*1.39	1.73	2.47	1.33	1.15	1.74	1.21	2.40	0.5
27	1.45	1.39	1.61	1.31	2.21	†3.59	1.31	1.21	1.99	1.14	2.18	0.58
28	1.33	1.35	1.65	1.53	1.93	3.71	1.35	1.35	2.74	1.10	1.58	0.5
29	1.31	1.38	1.51	1.43	-------	2.87	1.34	2.77	1.74	1.07	1.26	0.62
30	1.23	2.41	1.41	1.43	-------	2.47	1.27	2.55	1.64	1.02	1.16	0.66
31	1.16	-------	1.31	1.46	-------	2.21	-------	2.11	-------	0.98	1.38	-------

NOTES—*Creek frozen December 15, 1916 to January 5, 1917: January 12 to 13 and January 26 to February 27, 1917, inclusive. †Maximum 5.00 feet at 8 p. m. estimated from hydrograph. ‡Minimum 0.49 feet September 23, p. m. and September 24 a. m.

Daily Mean Gage Heights, in feet, of Mehoopany Creek near Mehoopany, Wyoming County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.62	4.63	1.19	1.53	2.35	2.34	1.46	2.09	1.91	0.88	0.71	1.35
2	0.62	3.30	1.25	1.53	2.20	2.14	1.53	2.08	1.69	1.07	0.67	1.30
3	0.60	2.20	1.18	1.63	2.15	2.01	1.55	1.99	1.55	1.08	0.59	1.10
4	0.58	1.86	1.13	1.68	2.14	1.94	1.77	1.90	1.52	1.01	0.66	0.85
5	0.62	1.72	1.09	1.76	2.12	1.84	1.65	1.77	1.48	0.97	0.83	0.81
6	0.69	1.38	1.07	1.81	2.08	2.06	1.43	1.73	1.54	0.94	0.82	1.68
7	0.68	1.04	1.11	1.83	2.06	2.06	1.45	1.68	1.81	0.82	0.63	1.45
8	0.67	0.99	1.11	1.86	2.08	1.98	1.43	1.57	1.57	0.94	0.71	1.24
9	0.77	0.93	*1.45	1.81	1.96	1.86	1.83	1.49	1.43	0.88	0.66	1.08
10	0.78	0.88	1.29	1.77	1.98	2.41	1.93	1.46	1.37	0.83	0.83	0.98
11	0.79	1.38	1.33	1.83	1.98	2.14	1.96	1.43	1.32	0.79	0.81	0.82
12	0.87	1.37	1.33	2.65	3.96	1.94	1.77	1.36	1.61	0.82	0.87	0.78
13	1.60	1.27	1.37	3.22	5.94	2.01	1.71	1.37	1.61	0.90	0.91	1.45
14	1.49	1.23	1.41	3.25	5.14	4.14	2.13	1.40	1.41	0.98	0.93	1.52
15	1.40	1.27	1.45	3.92	5.74	3.41	2.67	1.34	1.41	0.96	0.83	1.22
16	1.18	1.18	1.45	4.05	4.46	2.81	2.90	1.37	1.25	0.88	0.80	1.18
17	1.02	1.07	1.46	3.89	3.96	2.26	4.75	1.29	1.22	0.76	0.73	1.12
18	0.98	1.16	1.42	3.77	4.24	2.01	4.35	1.24	1.19	0.92	0.71	1.12
19	1.08	1.20	1.36	3.77	3.54	2.28	3.10	1.19	1.15	0.82	0.66	1.09
20	2.03	1.18	1.55	3.69	4.56	2.38	2.57	1.13	1.07	0.78	0.62	2.10
21	1.66	1.20	1.43	3.57	2.84	2.41	2.53	1.93	1.21	0.82	0.52	2.78
22	1.40	1.24	1.36	3.45	2.44	2.44	2.81	1.73	1.85	0.79	0.51	2.08
23	1.30	1.60	1.35	3.29	2.38	2.36	2.43	1.50	1.76	0.74	0.48	1.85
24	3.23	1.43	1.57	3.11	2.06	1.96	2.35	1.37	1.53	0.82	0.45	1.72
25	2.46	1.26	2.19	3.07	2.06	1.88	2.10	1.31	1.31	1.14	0.49	1.55
26	2.73	1.12	2.09	2.92	4.14	1.81	1.98	1.46	1.18	1.10	0.50	1.68
27	2.58	1.07	1.65	2.75	2.88	1.75	1.87	1.83	1.05	1.02	0.51	1.58
28	3.46	1.02	1.61	2.67	2.61	1.68	1.70	2.13	0.98	0.94	‡0.37	1.64
29	2.50	0.99	1.59	2.59	-------	1.58	1.23	2.27	0.88	0.82	0.99	1.45
30	†6.56	1.14	1.56	2.53	-------	1.48	2.14	2.40	0.83	0.89	1.13	1.34
31	6.08	-------	1.55	2.39	-------	1.48	-------	2.10	-------	0.77	1.19	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 20, 1918. †Maximum 6.9 feet at 12:00 noon. ‡Minimum 0.36 feet.

SUSQUSHANNA BASIN—STATION NO. 5

TUNKHANNOCK CREEK AT DIXON

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge at Dixon, Wyoming County.

Records Available.—Discharge measurements and gage heights from January 28, 1914, to September 30, 1918.

Drainage Area.—393 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge, and is read twice daily by N. L. Kneller.

Channel.—The right bank is high and steep and not subject to overflow, the left bank is low but does not overflow, and the bed is composed of coarse gravel. The thread of the current passes under the bridge at an angle.

Discharge Measurements of Tunkhannock Creek at Dixon, Wyoming County
(Drainage area 393. square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
13	Mar. 21	Brown & Heagy	588	2.75	700	0.2 & 0.8 method
14	April 16	Brown	517	2.41	450	0.2 & 0.8 method
15	July 10	Brown & Heagy	445	1.99	255	0.2 & 0.8 method
	1918					
16	Mar. 15	Wilson & Landis	1,007	5.53	3,457	0.2 & 0.8 method
17	Sept. 16	Hosmer & Shade	273	1.67	106	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Tunkhannock Creek at Dixon, Wyoming County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.74	1.59	2.80	2.27	2.39	2.57	3.57	1.82	2.66	2.25	1.42	1.47
2	1.65	1.64	2.41	2.15	2.33	2.31	3.82	1.83	3.59	2.63	1.42	1.49
3	1.62	1.62	2.28	2.10	2.06	2.23	3.69	1.72	3.21	2.46	1.43	1.38
4	1.28	1.51	2.22	2.14	2.09	2.12	3.16	1.69	2.72	2.16	1.47	1.33
5	1.31	1.51	2.16	2.58	2.09	1.96	2.96	2.13	2.50	2.06	1.35	1.31
6	1.36	1.55	2.05	4.42	2.07	1.77	3.20	2.62	2.51	2.03	1.31	1.25
7	1.36	1.52	2.08	3.36	*2.05	1.86	3.86	2.33	2.93	1.96	1.57	1.27
8	1.41	1.44	2.00	2.98	1.81	1.99	3.27	2.53	2.81	1.82	1.39	1.31
9	1.39	1.41	1.95	2.71	1.75	2.56	3.09	3.03	2.55	1.89	1.86	1.27
10	1.26	1.54	2.10	2.72	1.80	1.89	2.75	2.87	2.47	1.99	2.76	1.25
11	1.22	1.56	2.02	2.52	1.79	2.76	2.73	2.63	2.53	2.01	2.12	1.25
12	1.28	1.51	1.96	2.11	1.67	5.11	2.80	2.39	3.31	1.86	1.86	1.22
13	1.24	1.48	1.88	2.29	1.80	3.23	2.76	2.35	2.71	1.79	1.71	1.27
14	1.24	1.55	1.84	†6.02	1.60	2.99	2.60	2.17	2.47	1.73	2.03	1.27
15	1.49	1.55	1.78	3.68	1.64	2.63	2.53	2.05	2.57	1.79	1.86	1.23
16	1.38	1.50	1.84	3.22	1.60	2.69	2.35	1.97	2.69	1.79	1.85	1.21
17	1.36	1.49	1.82	2.82	1.62	3.11	2.16	2.19	2.51	1.71	1.73	1.20
18	1.32	1.54	1.90	2.61	1.62	2.89	2.42	2.07	2.23	1.69	1.63	1.21
19	1.34	1.50	1.84	2.40	1.81	2.46	2.03	1.96	2 19	1.79	1.51	1.17
20	2.22	1.48	1.89	2.30	1.93	2.19	2.05	1.89	2.17	2.01	1.45	1.20
21	2.78	1.49	1.81	2.14	2.02	2.78	2.09	1.83	2.23	1.89	1.41	1.17
22	2.32	1.41	2.18	2.38	2.06	2.73	1.99	1.82	2.09	1.71	1.47	1.19
23	2.08	1.45	3.22	2.32	1.97	3.19	1.92	1.86	2.07	1.61	1.37	1.20
24	1.95	2.10	3.05	2.22	2.10	5.21	1.95	1.78	3.36	1.69	1.49	1.17
25	1.86	1.95	2.78	2.11	2.83	4.42	1.83	1.65	2.53	1.77	1.66	1.15
26	1.74	1.70	2.40	1.88	2.26	4.13	1.89	1.70	2.26	1.67	1.47	1.13
27	1.64	1.64	2.32	1.78	5.67	5.03	1.90	1.66	3.06	1.53	1.35	‡1.09
28	1.62	1.74	2.38	1.94	3.23	5.29	1.89	1.99	2.62	1.52	1.33	1.13
29	1.58	1.81	2.41	1.98	-------	4.25	1.81	3.71	2.48	1.45	1.32	1.17
30	1.50	3.02	2.39	2.76	-------	3.63	1.73	3.59	2.66	1.57	1.75	1.21
31	1.51	-------	2.42	2.74	-------	3.41	-------	2.86	-------	1.49	1.65	-------

NOTES—*Creek frozen February 7 to 26, 1917, inclusive. †Maximum 7.05 feet at 4 p. m. ‡Minimum 1.06 feet September 27, p. m.

Daily Mean Gage Heights, in feet, of Tunkhannock Creek at Dixon, Wyoming County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.25	4.44	1.88	1.47	-------	4.80	2.17	2.88	3.16	1.87	1.14	1.88
2	1.21	3.72	2.09	1.49	-------	4.25	2.15	2.73	2.73	2.00	1.11	1.66
3	1.22	3.26	1.86	1.47	-------	3.86	2.21	2.51	2.41	1.77	1.07	1.48
4	1.22	2.96	1.87	1.47	-------	2.67	2.41	2.59	2.26	1.69	1.11	1.38
5	1.25	2.72	1.80	1.45	-------	3.05	2.17	2.45	2.16	1.67	1.37	1.26
6	1.29	2.58	1.72	1.45	-------	4.37	2.08	2.31	2.09	1.59	1.31	1.58
7	1.33	2.45	1.56	1.47	-------	3.87	1.99	2.28	2.15	1.60	1.24	1.67
8	1.22	2.26	1.49	1.65	-------	3.10	1.99	2.15	2.06	1.59	1.27	1.48
9	1.30	2.19	*1.56	1.57	-------	3.05	2.95	2.03	1.89	1.67	1.51	1.33
10	1.22	2.10	1.57	1.55	-------	4.47	3.05	1.88	1.81	1.63	1.38	1.30
11	1.22	2.08	1.62	1.72	-------	3.31	2.91	1.85	1.76	1.72	1.37	1.36
12	1.25	2.04	1.66	1.89	-------	3.10	2.93	1.84	2.06	1.59	1.38	1.32
13	1.66	1.95	1.66	1.75	4.05	3.50	3.01	1.91	2.01	1.51	1.33	1.63
14	1.53	1.91	1.71	1.82	3.75	6.95	3.65	2.39	1.82	1.46	1.47	1.80
15	1.39	1.85	1.70	-------	5.40	5.20	4.95	2.08	2.03	1.57	1.89	1.60
16	1.34	1.81	1.74	-------	3.99	3.83	4.75	1.91	1.81	1.49	1.55	1.54
17	1.29	1.79	1.80	-------	3.30	3.55	4.23	1.83	1.71	1.45	1.34	1.45
18	1.23	1.74	1.78	-------	2.89	3.55	4.85	1.75	1.65	1.50	1.27	1.79
19	1.26	1.68	1.79	-------	2.97	3.27	3.71	1.72	1.61	1.41	1.21	2.00
20	1.91	1.68	1.77	-------	8.70	3.60	3.29	1.61	1.57	1.45	1.17	2.18
21	1.83	1.75	1.78	-------	4.05	3.65	3.48	2.61	1.52	1.36	1.11	3.35
22	1.63	1.79	1.77	-------	3.47	3.63	5.01	2.21	2.81	1.32	1.08	2.54
23	1.51	2.76	1.70	-------	3.07	3.33	4.03	2.33	2.46	1.33	1.08	2.22
24	1.65	2.28	1.73	-------	2.93	2.97	3.71	2.12	2.18	1.23	1.11	1.98
25	3.79	1.94	1.74	-------	3.17	2.87	3.21	1.95	2.09	1.42	1.05	1.95
26	2.72	1.82	1.64	-------	6.90	2.73	2.98	2.21	1.85	1.42	‡1.00	2.48
27	2.33	1.77	1.58	-------	4.20	2.50	2.73	2.31	1.67	1.35	1.03	3.30
28	2.99	1.78	1.57	-------	3.70	2.33	2.62	2.28	1.59	1.23	‡1.01	2.75
29	2.61	1.76	1.50	-------	-------	2.27	2.45	2.11	1.53	1.15	1.24	2.38
30	†9.51	1.78	1.49	-------	-------	2.25	3.01	3.78	1.67	1.12	1.51	2.15
31	6.33	-------	1.48	-------	-------	2.21	-------	3.73	-------	1.09	1.39	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 15, 1918. †Maximum 11.7 feet at 8:00 p. m. ‡Minimum 0.99 feet.

SUSQUEHANNA BASIN—STATION NO. 6

BOWMAN CREEK AT EATONVILLE

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge at Eatonville, Wyoming County.

Records Available.—Discharge measurements and gage heights from January 28, 1914, to September 30, 1916, and discharge measurements October 1, 1916, to August 31, 1917; discharge measurements and gage heights from September 1, 1917, to September 30, 1918.

Drainage Area.—118 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the downstream side of the bridge and is read twice daily by Jenkins Harding.

Channel.—Both banks are high and not subject to overflow, and the bed is composed of coarse gravel.

Discharge Measurements of Bowman Creek at Eatonville, Wyoming County.
(Drainage area 118 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
17	Feb. 17	Wilson & Brown	105	2.64	40	Under complete ice cover
18	Mar. 21	Brown & Heagy	189	2.69	216	Surf. and 0.6 method
19	Apr. 16	Brown	175	2.56	156	0.6 method
20	July 10	Brown & Heagy	142	2.24	81	0.2 & 0.8 method
	1918					
21	Mar. 5	Wilson & Landis	338	4.38	1,002	0.2 & 0.8 Method.
22	Sept. 16	Hosmer & Shade	151	1.96	50	0.6 method

Daily Mean Gage Heights, in feet, of Bowman Creek at Eatonville, Wyoming County, for the year ending September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	2.01	3.91	2.45	2.62	3.31	3.51	2.61	3.24	3.00	2.35	1.88	2.06
2	1.91	3.45	2.37	2.67	3.32	3.34	2.57	3.08	2.81	2.20	1.84	1.98
3	1.85	3.29	2.27	2.72	3.27	3.28	2.60	3.02	2.64	2.10	1.84	1.90
4	††1.85	2.96	2.29	2.77	3.25	3.10	2.66	3.04	2.58	2.10	1.85	1.88
5	††1.85	2.86	2.23	2.77	3.27	3.02	2.56	2.95	2.53	2.08	1.98	1.88
6	††1.85	2.77	2.27	2.81	3.27	3.12	2.52	2.86	2.55	2.06	1.85	2.68
7	††1.85	2.73	2.19	2.89	3.26	3.22	2.49	2.78	2.68	2.06	‡1.78	2.20
8	1.86	2.69	*2.49	2.92	3.27	3.04	2.50	2.70	2.56	2.00	1.85	2.04
9	1.87	2.63	2.67	3.05	3.31	3.09	2.86	2.66	2.45	1.98	1.85	1.98
10	1.87	2.59	2.57	3.07	3.31	3.88	2.84	2.58	2.38	1.98	1.88	1.98
11	1.85	2.53	2.57	3.03	3.35	3.30	2.77	2.53	2.36	1.98	1.96	1.92
12	1.95	2.47	2.62	3.22	3.59	3.20	2.79	2.48	2.54	2.02	1.96	1.92
13	2.25	2.42	2.67	3.29	4.67	3.36	2.77	2.48	2.44	1.96	2.03	2.01
14	2.05	2.36	2.67	3.42	4.46	5.14	3.31	2.54	2.36	1.96	2.22	2.08
15	1.94	2.31	2.77	3.47	6.49	4.40	4.37	2.48	2.30	2.00	2.04	1.97
16	1.91	2.27	2.57	3.47	5.43	3.81	4.80	2.35	2.22	1.96	1.95	1.99
17	1.88	2.27	2.57	3.47	4.67	3.54	5.16	2.31	2.18	2.06	1.90	1.99
18	1.87	2.27	2.72	3.46	4.52	3.46	4.86	2.30	2.13	2.09	1.87	2.04
19	2.06	2.21	2.75	3.43	4.52	3.44	3.91	2.26	2.09	1.98	1.86	2.25
20	2.75	2.18	2.69	3.42	5.87	3.58	3.56	2.92	2.06	1.97	1.84	2.55
21	2.36	2.22	2.22	3.45	4.12	3.58	3.94	2.58	2.08	1.94	1.83	2.91
22	2.27	2.27	2.29	3.45	3.92	3.52	4.28	2.70	2.43	1.88	1.81	2.48
23	2.33	2.63	2.45	3.43	3.48	3.42	2.81	2.60	2.26	1.86	1.82	2.32
24	3.17	2.43	2.44	3.42	3.18	3.12	3.54	2.57	2.17	1.86	1.79	2.26
25	3.72	2.28	2.22	3.37	3.48	3.03	3.31	2.56	2.13	1.94	1.79	2.22
26	3.15	2.32	2.39	3.37	5.41	2.94	3.15	2.53	2.08	1.94	1.78	2.80
27	2.97	2.39	2.41	3.37	4.11	2.82	3.02	3.18	2.06	1.88	1.78	2.68
28	3.49	2.25	2.39	3.37	3.68	2.71	2.93	3.56	2.05	1.88	1.77	2.52
29	3.11	2.26	2.42	3.37	-------	2.68	2.84	3.21	2.04	1.86	1.90	2.38
30	†7.57	2.22	2.47	3.37	-------	2.66	3.36	3.47	1.99	1.90	1.97	2.32
31	4.82	-------	2.59	3.37	-------	3.14	-------	3.21	-------	1.91	1.96	-------

NOTES—*Gage heights affected by ice December 8, 1917 to February 20, 1918. †Maximum 8.80 feet at 11:00 a. m. ††Estimated. ‡Minimum 1.76 feet.

SUSQUEHANNA BASIN—STATION NO. 7

LACKAWANNA RIVER AT MOOSIC

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge at River Street, or Moosic Road, Moosic, Lackawanna County.

Records Available.—Discharge complete from August 8, 1913, to September 30, 1916, and discharge measurements and gage heights October 1, 1916, to September 30, 1918. For other records on this river see Lackawanna River at Scranton in the 1911, 1912 and 1913 reports of the Water Supply Commission.

Drainage Area.—265 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the downstream side of the bridge and is read twice daily by Nelson Ross.

Channel.—Both banks are high, although the right bank may overflow during extreme stages, and the bed is composed of rocks and culm.

Discharge Measurements of Lackawanna River at Moosic, Lackawanna County
(Drainage area 265 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
18	Mar. 23	Brown & Heagy	269	2.80	630	0.2 & 0.8 method
19	Apr. 15	Brown	266	2.69	469	0.2 & 0.8 method
20	Apr. 22	Brown	223	2.46	370	0.2 & 0.8 method
21	May 17	Brown & Heagy	242	2.51	392	0.2 & 0.8 method
22	July 5	Brown & Heagy	195	2.38	323	0.2 & 0.8 method
23	July 12	Heagy	198	2.47	353	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Lackawanna River at Moosic, Lackawanna County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.92	2.00	2.63	2.22	2.28	2.53	3.3	2.29	2.56	2.64	2.05	2.11
2	1.85	1.94	2.50	2.22	2.25	2.39	3.4	2.29	2.98	2.72	2.06	2.11
3	1.82	1.92	2.36	2.29	2.17	2.36	3.4	2.22	2.91	2.61	2.03	2.04
4	1.81	1.96	2.31	2.32	2.09	2.29	3.4	2.15	2.72	2.41	1.98	2.00
5	1.82	1.88	2.30	2.72	2.15	2.27	3.2	2.77	2.64	2.33	1.96	1.95
6	1.82	1.88	2.21	3.3	2.12	2.26	3.1	2.89	2.81	2.31	2.00	1.96
7	1.81	1.88	2.18	2.91	2.07	2.26	3.2	2.82	2.90	2.51	1.96	1.95
8	‡1.78	1.89	2.13	2.76	2.13	2.55	3.1	2.92	2.85	2.42	2.06	1.96
9	1.81	1.88	2.23	2.65	2.17	2.52	3.0	3.0	2.72	2.35	3.1	1.95
10	1.80	1.96	2.20	2.57	2.07	2.52	2.77	2.99	2.62	2.38	2.54	1.92
11	‡1.78	1.97	2.17	2.45	2.02	2.77	2.78	2.83	3.0	2.46	2.24	1.91
12	1.78	1.93	2.20	2.41	2.02	3.7	2.89	2.73	4.0	2.45	2.21	1.90
13	1.83	1.95	2.20	2.35	2.02	3.1	2.89	2.65	3.4	2.35	2.11	1.89
14	1.88	2.08	2.13	3.3	2.02	2.99	2.75	2.56	3.2	2.34	2.21	1.89
15	1.86	2.00	2.08	2.94	2.02	2.79	2.70	2.49	3.0	2.28	2.18	1.86
16	1.86	1.98	2.01	2.69	2.00	2.82	2.59	2.41	3.0	2.34	2.31	1.83
17	1.88	1.98	1.98	2.59	2.03	2.92	2.48	2.53	2.91	2.28	2.26	1.86
18	1.87	1.98	2.03	2.52	2.09	2.81	2.42	2.49	2.71	2.22	2.26	1.86
19	1.88	1.93	2.03	2.49	2.06	2.62	2.45	2.39	2.68	2.18	2.14	1.85
20	1.90	1.98	2.01	2.39	2.06	2.52	2.49	2.42	2.51	2.18	2.11	1.86
21	2.23	1.95	2.03	2.33	2.05	2.57	2.47	2.32	2.74	2.15	2.10	1.86
22	2.16	1.93	2.50	2.52	2.02	2.57	2.43	2.27	2.71	2.12	2.06	1.86
23	2.13	2.10	2.50	2.35	2.02	2.74	2.37	2.37	2.63	2.10	2.05	1.84
24	2.03	2.21	2.42	2.25	2.43	†4.2	2.39	2.36	3.5	2.12	2.28	1.85
25	1.92	2.11	2.36	2.22	2.12	4.3	2.32	2.31	3.0	2.13	2.20	1.86
26	1.88	2.08	2.26	2.17	2.09	4.0	2.27	2.23	2.71	2.08	2.10	1.83
27	1.88	2.06	2.30	2.13	2.96	4.1	2.39	2.77	3.0	2.10	2.04	1.83
28	1.87	2.08	2.40	2.15	2.75	4.7	2.39	3.4	2.81	2.04	2.01	1.88
29	1.86	2.18	2.33	2.23	-------	4.0	2.29	3.4	2.77	2.05	2.04	1.88
30	1.88	2.72	2.24	2.58	-------	3.5	2.26	3.2	2.78	2.06	2.10	1.84
31	1.88	-------	2.23	2.37	-------	3.3	-------	2.46	-------	2.06	2.14	-------

NOTES—†Maximum 5.2 feet at 9 p. m. estimated from hydrograph. ‡Minimum 1.77 feet October 8, 11 and 12, 1916

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.91	4.5	2.28	1.95	1.87	3.3	2.46	2.94	2.90	2.12	1.85	2.01
2	1.88	3.8	2.25	1.90	1.84	3.3	2.44	2.81	2.77	2.05	1.88	1.92
3	1.86	3.3	2.24	1.88	1.82	3.2	2.47	2.73	2.55	2.02	1.85	1.89
4	1.90	2.96	2.24	1.85	1.87	3.0	2.53	2.73	2.43	2.04	1.96	1.88
5	1.88	2.90	2.22	1.90	1.95	2.98	2.39	2.64	2.73	2.04	2.10	1.86
6	1.86	2.86	2.20	1.92	2.01	3.4	2.30	2.59	2.29	2.04	1.89	2.02
7	1.82	2.76	2.15	1.95	1.95	3.3	2.24	2.53	2.28	2.00	1.85	1.92
8	1.85	2.66	2.12	1.85	1.93	3.0	2.24	2.47	2.24	1.98	1.86	1.83
9	1.88	2.56	2.11	1.93	1.93	2.92	2.46	2.39	2.24	1.97	1.90	1.88
10	‡1.76	2.51	2.11	1.93	1.89	3.5	2.86	2.37	2.24	2.02	1.92	1.83
11	1.88	2.41	1.96	1.92	2.07	3.0	2.70	2.38	2.21	2.02	1.86	1.84
12	2.42	2.41	*2.04	2.23	2.24	2.98	2.67	2.34	2.57	2.00	1.86	1.86
13	2.12	2.41	2.01	1.93	2.58	2.92	2.72	2.57	2.33	1.99	1.89	1.86
14	1.99	2.41	1.98	2.14	2.43	4.2	2.83	2.97	2.29	2.04	1.93	1.88
15	1.99	2.31	2.01	1.95	3.1	4.0	3.5	2.71	2.23	2.06	2.06	1.86
16	1.94	2.31	1.96	1.94	2.74	3.4	4.2	2.53	2.19	2.03	1.93	1.88
17	1.90	2.30	1.96	1.95	2.57	3.2	4.6	2.44	2.17	1.96	1.88	1.90
18	1.89	2.26	2.01	1.93	2.45	3.3	4.8	2.39	2.14	1.94	1.83	2.16
19	1.95	2.26	2.00	1.95	2.73	3.4	4.0	2.34	2.09	1.94	1.84	2.06
20	2.16	2.18	1.96	1.85	5.0	3.4	3.6	2.31	2.06	1.90	1.84	2.04
21	2.07	2.16	2.01	1.93	3.8	3.4	3.6	2.81	2.05	1.98	1.89	2.28
22	2.01	2.25	1.98	1.93	3.1	3.4	3.9	2.73	2.45	1.93	1.88	2.10
23	1.98	2.54	1.96	1.94	2.97	3.2	3.6	2.75	2.30	1.93	1.83	2.04
24	2.86	2.45	1.96	1.91	2.92	3.1	3.4	2.51	2.23	2.23	1.86	2.00
25	3.1	2.28	1.96	1.91	3.0	2.92	3.2	2.43	2.17	2.09	1.79	1.98
26	2.71	2.18	1.96	1.91	4.5	2.84	3.0	2.49	2.14	1.90	1.86	3.0
27	2.18	2.16	1.98	1.89	3.7	2.68	2.87	2.49	2.11	1.86	1.84	2.79
28	3.4	2.16	1.98	1.88	3.3	2.62	2.77	2.50	2.07	1.84	1.83	2.59
29	2.96	2.16	2.03	1.90	-------	2.54	2.69	2.37	2.05	1.84	1.88	2.39
30	†8.1	2.16	2.01	1.89	-------	2.48	2.90	3.2	2.04	1.94	1.85	2.30
31	5.8	-------	1.96	1.85	-------	2.42	-------	3.2	-------	1.96	1.84	-------

NOTES—*Gage heights affected by ice January 11 to 14, 20, 21 and February 5 to 7, 1918. †Maximum 8.8 feet at 10:00 p. m. ‡Minimum 1.61 feet.

SUSQUEHANNA BASIN—STATION NO. 8

NORTH BRANCH SUSQUEHANNA RIVER AT WILKES-BARRE

DESCRIPTION OF STATION

Location.—At four span, steel, through truss, highway bridge at Market Street, Wilkes-Barre, Luzerne County.

Records Available.—Discharge complete from March 30, 1899, to September 30, 1918. For other records on this river see North Branch Susquehanna River at Binghamton, N. Y., Towanda and Danville.

Drainage Area.—9,960 square miles.

Gage.—A standard chain gage, whose elevation of zero is 511.03 feet above mean sea level, is located on the upstream side of the bridge and is read twice daily by Milton Wentz.

Channel.—The right bank is low and overflows at gage height of about 18.5 feet, the left bank is high and overflows only at extreme stages, and the bed is composed of gravel, sand and culm.

Discharge Measurements of North Branch Susquehanna River at Wilkes-Barre, Luzerne County.
(Drainage area 9,960 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
49	July 3	Brown & Heagy	8,810	11.49	42,734	Surface method
50	Sept. 5	Brown & Warlow	5,148	5.88	12,065	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of North Branch Susquehanna River at Wilkes-Barre, Luzerne County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	5.4	3.7	5.8	4.2	-------	-------	10.8	4.7	9.4	9.8	5.8	6.6
2	5.4	3.6	6.8	4.2	-------	7.5	11.1	4.7	8.0	8.9	5.2	5.9
3	4.9	3.7	6.7	4.2	-------	7.6	12.6	4.8	7.9	11.8	4.7	6.1
4	4.4	3.8	6.1	4.2	-------	6.8	13.2	4.9	7.5	11.7	4.9	6.6
5	4.0	3.9	5.6	4.6	-------	5.9	11.7	4.9	6.9	9.7	4.3	5.9
6	3.8	3.9	5.4	5.9	-------	5.3	10.4	5.2	6.3	8.2	4.3	5.1
7	3.6	3.7	5.3	7.8	-------	4.9	10.5	7.6	6.2	7.5	4.2	4.7
8	3.5	3.9	5.4	7.8	-------	4.8	11.6	8.8	12.2	6.8	4.0	4.6
9	3.3	4.0	5.2	7.4	-------	5.0	10.8	8.6	12.3	6.3	4.4	4.5
10	3.2	4.0	5.0	6.7	-------	5.1	9.5	8.6	11.9	6.1	14.3	5.1
11	3.1	3.9	4.8	6.4	-------	5.4	8.5	8.3	10.4	6.6	10.1	4.9
12	3.1	3.8	5.0	6.0	-------	11.1	7.8	7.6	11.8	6.6	7.9	4.6
13	3.0	4.2	5.0	4.8	-------	12.6	7.5	6.8	11.4	6.4	6.7	4.4
14	‡3.0	4.2	4.8	*	-------	9.7	7.5	6.4	10.9	6.9	5.9	4.1
15	3.0	4.0	4.3	-------	-------	8.8	7.3	6.1	10.0	6.6	9.4	3.9
16	3.0	4.0	*	-------	-------	8.0	6.8	5.8	9.3	6.9	10.3	3.7
17	3.2	4.4	-------	-------	-------	7.9	6.4	5.5	9.2	7.2	8.5	3.6
18	3.3	4.5	-------	-------	-------	8.2	6.2	5.3	8.5	6.7	8.3	3.5
19	3.3	4.3	-------	-------	-------	7.5	5.9	5.2	7.7	6.5	6.7	3.4
20	3.9	4.2	-------	-------	-------	6.4	5.7	5.1	7.3	6.8	5.7	3.3
21	4.2	4.1	-------	-------	-------	6.3	5.7	4.9	7.9	7.4	5.1	3.3
22	6.0	4.1	4.3	-------	-------	6.7	5.9	4.8	11.2	8.2	4.7	3.6
23	6.6	4.1	4.2	-------	-------	7.4	6.0	5.0	9.4	7.7	4.4	3.6
24	5.9	4.2	4.4	-------	-------	9.4	5.8	4.9	8.7	6.7	5.1	3.4
25	5.2	4.4	4.6	-------	-------	13.5	5.4	5.4	10.5	6.1	8.7	3.3
26	4.7	5.9	4.7	-------	-------	15.3	5.2	5.3	10.0	5.8	8.2	3.2
27	4.4	6.1	4.8	-------	-------	15.4	5.0	5.0	9.0	5.3	6.6	3.1
28	4.2	5.4	5.0	-------	-------	†17.3	4.9	5.0	10.5	5.1	5.6	3.0
29	4.0	5.0	4.8	-------	-------	17.5	4.9	5.8	11.6	5.2	4.9	3.0
30	3.9	5.0	4.6	-------	-------	15.2	4.8	12.2	10.2	4.9	5.6	‡3.0
31	3.8	-------	4.5	-------	-------	13.0	-------	11.6	-------	7.8	6.4	-------

NOTES—*River frozen December 16 to 21, 1916, and January 14 to March 1, 1917, inclusive. †Maximum 17.7 feet at midnight estimated from hydrograph. ‡Minimum 2.98 feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	3.0	16.6	4.3	3.8	3.2	14.1	6.6	6.9	9.6	3.8	2.7	2.48
2	2.9	14.2	4.5	3.5	3.2	18.6	6.6	7.2	7.8	4.3	2.7	2.7
3	2.9	11.9	4.6	3.4	3.2	15.2	6.6	7.4	7.1	4.4	2.7	2.5
4	3.0	9.6	4.8	3.4	3.2	12.7	7.0	7.0	6.3	4.5	2.7	2.42
5	3.0	8.5	4.8	3.0	3.4	10.7	7.8	6.6	5.6	4.4	2.6	3.0
6	3.0	7.7	4.5	3.0	3.2	9.7	7.6	6.4	5.3	4.2	2.7	3.1
7	3.2	7.1	4.4	3.1	3.0	10.8	6.8	6.1	5.0	4.0	2.7	3.2
8	3.6	6.7	4.0	3.1	3.1	11.3	6.2	5.8	5.2	3.8	2.7	2.9
9	3.6	6.3	*3.0	2.9	3.1	10.8	6.0	5.5	6.3	3.6	2.7	2.7
10	3.6	6.0	3.0	2.9	3.0	10.4	7.8	5.4	6.0	3.4	2.7	2.7
11	3.6	5.7	3.0	2.9	3.0	11.0	8.8	5.1	5.4	3.4	2.7	2.7
12	3.8	5.5	2.7	3.0	3.1	10.2	8.6	4.9	5.0	3.2	2.9	2.6
13	3.7	5.3	3.6	3.9	3.9	9.5	8.3	5.0	5.0	3.4	3.0	2.6
14	3.7	5.1	3.6	3.9	5.2	15.4	8.5	7.5	7.3	4.6	3.2	2.8
15	4.9	4.9	3.6	3.2	11.8	†22.4	12.0	10.4	6.5	4.9	3.1	2.9
16	4.7	4.8	3.6	2.9	11.8	20.5	17.5	9.2	5.8	4.5	3.1	2.8
17	4.4	4.7	3.7	3.6	9.5	12.2	17.5	7.7	5.2	4.1	3.0	2.9
18	4.9	4.6	3.6	3.7	7.7	11.2	15.6	6.8	4.8	3.9	2.9	3.0
19	4.7	4.5	3.8	3.8	7.3	11.3	14.5	5.9	4.4	3.8	2.7	3.1
20	5.2	4.4	3.8	3.8	10.2	11.9	12.3	5.6	4.3	3.6	2.6	4.1
21	8.7	4.3	3.8	3.9	16.8	12.7	10.3	5.6	4.0	3.6	2.49	5.6
22	7.8	4.3	3.9	3.7	12.5	13.1	10.4	7.8	4.1	3.6	2.38	7.1
23	6.8	4.6	3.8	3.5	11.1	13.2	10.8	8.0	5.2	3.4	2.34	6.2
24	6.2	4.9	3.8	3.5	9.5	12.3	10.8	7.9	6.2	3.2	2.31	5.4
25	11.8	5.6	3.9	3.5	8.8	11.2	10.1	7.8	5.8	3.1	2.28	4.8
26	13.8	5.3	3.9	3.5	11.1	9.9	9.1	6.6	5.2	3.1	2.22	4.6
27	11.7	4.6	3.8	3.5	14.9	9.0	8.4	7.3	4.7	3.5	2.20	6.1
28	11.1	4.4	3.8	3.3	13.2	8.4	7.4	8.9	4.3	3.3	‡2.18	7.6
29	11.2	4.1	4.2	3.3	-------	7.7	7.0	9.1	4.1	3.1	2.26	6.9
30	14.2	4.2	4.2	3.3	-------	7.2	6.9	10.6	3.8	2.9	2.24	6.3
31	18.0	-------	3.8	3.3	-------	6.7	-------	11.6	-------	2.8	2.44	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 14, 1918, and discharge estimated from climatological records. †Maximum 23.0 feet at Midnight (15-16) ‡Minimum 2.17 feet.

Daily discharge, in second-feet, of North Branch Susquehanna River at Wilkes-Barre, Luzerne County for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-17												
1	8,940	3,500	10,500	4,800	8,940	13,400	33,500	6,380	26,700	28,600	10,500	13,900
2	8,940	3,250	14,800	4,800	8,180	17,900	34,900	6,380	20,200	24,400	8,180	10,900
3	7,080	3,500	14,300	4,800	7,080	18,200	42,500	6,730	19,700	38,400	6,380	11,700
4	5,380	3,740	11,700	4,800	5,700	14,800	45,700	7,080	17,900	37,900	7,080	13,900
5	4,260	4,000	9,710	6,040	5,080	10,900	37,900	7,080	15,200	28,200	5,080	10,900
6	3,740	4,000	8,940	10,900	4,800	8,560	31,500	8,180	12,600	21,100	5,080	7,810
7	3,250	3,500	8,560	19,200	4,260	7,080	32,000	18,300	12,200	17,900	4,800	6,380
8	3,010	4,000	8,940	19,200	4,000	6,730	37,400	23,900	40,500	14,800	4,260	6,040
9	2,560	4,260	8,180	17,400	4,520	7,440	33,500	23,000	41,600	12,600	5,380	5,700
10	2,360	4,200	7,440	14,300	4,260	7,810	27,200	23,000	39,000	11,700	51,500	7,810
11	2,180	4,000	6,730	13,000	4,000	8,940	22,500	21,600	31,500	13,900	30,100	7,080
12	2,180	3,740	7,440	11,300	3,500	34,900	19,200	18,300	38,400	13,900	19,700	6,040
13	2,000	4,800	7,440	6,730	3,250	42,500	17,900	14,800	36,400	13,000	14,300	5,380
14	‡2,000	4,800	6,730	*5,380	3,010	28,200	17,900	13,000	34,000	15,200	10,900	4,520
15	2,000	4,260	5,080	15,600	2,900	23,900	17,000	11,700	29,600	13,900	26,700	4,000
16	2,000	4,260	*4,000	12,200	2,780	20,200	14,800	10,500	26,300	15,200	31,000	3,500
17	2,360	5,380	3,250	9,710	2,670	19,700	13,000	9,320	25,800	16,500	22,500	3,250
18	2,560	5,700	2,460	7,440	3,250	21,100	12,200	8,560	22,500	14,300	21,600	3,010
19	2,560	5,080	2,180	6,730	3,250	17,900	10,900	8,180	18,800	13,400	14,300	2,780
20	4,000	4,800	2,000	5,380	2,780	13,000	10,100	7,810	17,000	14,800	10,100	2,560
21	4,800	4,520	2,360	4,260	3,250	12,600	10,100	7,080	19,700	17,400	7,810	2,560
22	11,300	4,520	5,080	3,740	3,010	14,300	10,900	6,730	35,400	21,100	6,380	3,256
23	13,900	4,520	4,800	7,440	3,500	17,400	11,300	7,440	26,700	18,800	5,380	3,250
24	10,900	4,800	5,380	6,730	3,740	26,700	10,500	7,080	23,400	14,300	7,810	2,780
25	8,180	5,380	6,040	4,800	3,740	47,200	8,940	8,940	32,000	11,700	23,400	2,560
26	6,380	10,900	6,380	4,260	3,250	57,500	8,180	8,560	29,600	10,500	21,100	2,360
27	5,380	11,700	6,730	3,250	4,800	58,200	7,440	7,440	24,800	8,560	13,900	2,180
28	4,800	8,940	7,440	2,780	7,440	†72,400	7,080	7,440	32,000	7,810	9,710	2,000
29	4,260	7,440	6,730	3,740	-------	74,100	7,080	10,500	37,400	8,180	7,080	2,000
30	4,000	7,440	6,040	5,380	-------	56,900	6,730	40,500	30,600	6,730	9,710	‡2,000
31	3,740	-------	5,700	7,440	-------	44,600	-------	37,400	-------	19,200	13,000	-------

NOTES—*River frozen December 16 to 21, 1916, and January 14 to March 1, 1917, inclusive, and discharge estimated from climatological data. †Maximum=75,700 second-feet. ‡Minimum=1,970 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-18												
1	2,000	66,900	5,080	1,400	1,340	50,400	13,900	15,200	27,700	3,740	1,540	1,250
2	1,840	50,900	5,700	1,280	1,340	83,200	13,900	16,500	19,200	5,080	1,540	1,540
3	1,840	39,000	6,040	1,160	1,280	56,900	13,900	17,400	16,100	5,380	1,540	1,280
4	2,000	27,700	6,730	1,110	1,280	43,100	15,600	15,600	12,600	5,700	1,540	1,180
5	2,000	22,500	6,730	1,060	1,220	33,000	19,250	13,900	9,710	5,380	1,400	2,000
6	2,000	18,800	5,700	1,060	1,160	28,200	18,300	13,000	8,560	4,800	1,540	2,180
7	2,360	16,100	5,380	1,160	1,160	33,500	14,800	11,700	7,440	4,260	1,540	2,360
8	3,250	14,300	4,260	1,160	1,160	35,900	12,200	10,500	8,180	3,740	1,540	1,840
9	3,250	12,600	*2,000	1,060	1,110	33,500	11,300	9,320	12,600	3,250	1,540	1,540
10	3,250	11,300	1,280	1,060	1,060	31,500	19,200	8,940	11,300	2,780	1,540	1,540
11	3,250	10,100	1,110	1,010	1,060	34,500	23,900	7,810	8,940	2,780	1,540	1,540
12	3,740	9,320	1,060	1,160	1,110	36,600	23,000	7,080	7,440	2,560	1,840	1,400
13	3,500	8,560	1,060	2,000	1,340	27,200	21,600	7,440	7,410	2,780	2,000	1,400
14	3,560	7,810	1,060	2,000	4,260	58,200	22,500	17,900	17,000	6,040	2,360	1,680
15	7,080	7,080	1,000	1,840	38,400	†118,000	39,500	31,500	13,400	7,080	2,180	1,840
16	6,380	6,730	1,060	1,760	38,400	99,900	74,100	25,800	10,500	5,700	2,180	1,680
17	5,380	6,380	1,060	1,760	27,200	40,500	74,100	18,800	8,180	4,520	2,000	1,840
18	7,080	6,040	1,060	1,680	18,800	35,400	59,600	14,800	6,730	4,000	1,840	2,000
19	6,380	5,700	1,110	1,680	17,000	35,900	52,600	10,900	5,380	3,740	1,540	2,180
20	8,180	5,380	1,220	1,680	30,600	39,000	41,000	9,710	5,080	3,250	1,400	4,520
21	23,400	5,080	1,340	1,680	68,400	43,100	31,000	9,710	4,260	3,250	1,260	9,710
22	19,200	5,080	1,400	1,610	42,000	45,100	31,500	19,200	4,520	3,250	1,140	16,100
23	14,800	6,040	1,540	1,610	34,900	45,700	33,500	20,200	8,180	2,780	1,100	12,200
24	12,200	7,009	1,680	1,540	27,200	41,000	33,500	19,700	12,200	2,360	1,060	8,940
25	38,400	9,710	1,840	1,540	23,900	35,400	30,100	19,200	10,500	2,180	1,010	6,730
26	48,800	8,560	1,840	1,540	34,900	29,100	25,300	13,900	8,180	2,180	983	6,040
27	37,900	6,040	1,700	1,540	53,000	24,800	22,000	17,000	6,380	3,010	965	11,700
28	34,900	5,380	1,680	1,540	45,700	22,000	17,400	24,400	5,080	2,560	‡951	18,300
29	35,400	4,520	1,610	1,470	-------	18,800	15,600	25,300	4,520	2,180	1,020	15,200
30	50,900	4,800	1,540	1,400	-------	16,500	15,200	32,500	3,740	1,840	1,000	12,600
31	78,200	-------	1,470	1,400	-------	14,300	-------	37,400	-------	1,680	1,210	-------

NOTES—*Gage heights affected by ice December 9, 1917, to February 14, 1918, and discharge estimated from climatological records. †Maximum 124,000 second-feet from hydrograph at mid-night (15-16). ‡Minimum 944 second-feet.

Estimated Monthly Discharge of North Branch Susquehanna River at Wilkes-Barre, Luzerne County.

(Drainage area 9,960 square miles)

MONTH	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916–1917					
October	13,900	‡2,000	4,870	0.49	0.56
November	11,700	3,250	5,170	0.52	0.58
December	14,800		6,870	0.69	0.80
January	19,200		8,180	0.82	0.94
February			4,320	0.43	0.45
March	†74,100	6,730	26,600	2.67	3.08
April	45,700	6,730	20,000	2.01	2.24
May	40,500	6,380	13,000	1.31	1.51
June	41,000	12,200	27,200	2.73	3.05
July	38,400	6,730	16,900	1.70	1.96
August	51,500	4,260	14,000	1.41	1.63
September	13,900	‡2,000	5,400	0.54	0.60
The year	74,100	2,000	12,800	1.29	17.40

NOTES—River frozen December 16 to 21, 1916, and January 14 to March 1, 1917, inclusive, and discharge estimated from climatological data. †Maximum=75,700 second-feet, March 28, 1917. ‡Minimum=1,970 second-feet, October 14, 1916 and September 30, 1917.

MONTH	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917–1918					
October	78,200	1,840	15,200	1.53	1.76
November	66,900	4,520	13,800	1.39	1.55
December	6,730		2,500	0.25	0.29
January			1,450	0.15	0.17
February	68,400		18,700	1.88	1.96
March	118,000	14,300	41,400	4.16	4.80
April	74,100	11,300	28,000	2.81	3.14
May	37,400	7,080	16,800	1.69	1.95
June	27,700	3,740	9,700	0.97	1.08
July	7,080	1,680	3,670	0.37	0.43
August	2,360	951	1,480	0.15	0.17
September	18,300	1,180	5,140	0.52	0.58
The year	118,000	951	13,100	1.32	17.88

NOTES—Gage heights affected by ice December 9, 1917 to February 14, 1918, and discharge estimated from climatological records. Maximum 124,000 second-feet at mid-night, March 15–16. Minimum 944 second-feet August 28.

SUSQUEHANNA BASIN—STATION NO. 9

NESCOPECK CREEK NEAR ST. JOHNS

DESCRIPTION OF STATION

Location.—At single span, steel truss, highway bridge, the first above the Wilkes-Barre and Hazleton Railway bridge at St. Johns, Luzerne County.

Records Available.—Discharge measurements and gage heights from July 13, 1916, to September 30, 1918.

Drainage Area.—49 square miles.

Gage.—A standard chain gage, whose elevation of zero is 1,116.47 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by Mrs. Edwin Sterling.

Channel.—Both banks are high, and the bed is composed of gravel and boulders.

Remarks.—During floods water passes around the right of the bridge through a culvert under the road leading to the bridge.

Discharge Measurements of Nescopeck Creek near St. Johns, Luzerne County
(Drainage area 49 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
2	Feb. 10	Boehringer Wilson & Brown	53	2.54	32	Under ice cover
3	Feb. 17	Wilson & Brown	24	1.84	18	Under ice cover
4	Mar. 24	Brown & Heagy	88	2.58	212	0.2 & 0.8 method
5	April 18	Brown	68	1.87	66	0.2 & 0.8 method
6	April 26	Brown	62	1.72	47	0.2 & 0.8 method
7	May 16	Brown & Heagy	64	1.80	52	0.2 & 0.8 method
8	July 5	Brown & Heagy	67	1.84	57	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Nescopeck Creek near St. Johns, Luzerne County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.40	1.90	1.80	3.40	2.50	2.90	2.70	1.60	2.20	2.50	1.20	1.50
2	1.40	1.80	1.80	3.30	2.40	2.30	2.60	1.60	2.50	2.50	1.20	1.50
3	1.30	1.70	1.80	3.10	*3.40	2.20	2.60	1.60	2.80	2.50	1.20	1.40
4	1.30	1.60	1.80	2.70	4.40	2.10	2.60	1.60	2.40	2.30	1.20	1.40
5	1.30	1.60	1.80	2.60	3.30	2.40	2.60	1.60	2.40	1.90	1.10	1.30
6	1.30	1.50	1.60	3.30	2.80	2.50	2.80	1.80	3.30	1.80	1.20	1.20
7	1.30	1.50	1.60	2.90	2.80	2.60	2.90	1.90	2.80	1.60	1.60	‡1.00
8	1.30	1.50	1.60	2.60	2.80	2.60	2.60	1.90	2.70	1.60	1.80	1.70
9	1.30	1.50	1.60	2.40	2.60	2.60	2.60	2.00	2.60	1.70	3.60	1.80
10	1.30	1.50	1.60	2.40	2.60	2.70	2.40	2.30	2.50	1.70	3.00	1.60
11	1.20	1.50	1.70	2.30	2.60	2.80	2.40	2.10	2.50	1.90	2.40	1.60
12	1.20	1.50	1.80	2.10	2.40	3.00	2.30	2.00	2.90	1.80	2.00	1.40
13	1.20	1.50	1.80	2.50	2.40	2.50	2.20	2.00	2.60	1.60	1.80	1.40
14	1.40	1.50	*2.00	3.10	2.40	2.40	2.20	2.60	2.30	1.80	2.00	1.30
15	1.40	1.50	2.40	3.50	2.30	2.30	2.10	1.80	2.20	1.80	2.00	1.30
16	1.40	1.50	2.80	3.20	2.30	2.30	2.00	1.80	2.10	1.70	5.90	1.30
17	1.30	1.50	2.80	3.30	2.00	2.20	2.00	1.80	2.20	1.70	3.90	1.20
18	1.20	1.50	2.80	*3.50	2.20	2.40	1.80	1.80	2.20	1.60	3.10	1.20
19	1.30	1.50	2.90	3.70	2.20	2.30	1.80	1.80	2.00	1.60	2.80	1.20
20	2.30	1.40	2.90	3.90	2.20	2.20	1.80	1.80	1.90	1.40	2.40	1.20
21	2.60	1.40	2.90	4.00	2.20	2.20	1.80	1.80	1.90	1.40	2.00	1.10
22	2.40	1.40	2.50	4.00	2.20	2.20	1.80	1.80	2.50	1.20	2.00	1.10
23	2.30	1.40	2.10	4.00	2.10	2.20	1.80	1.60	2.20	1.30	1.80	‡1.00
24	2.30	2.00	2.10	4.10	3.00	2.50	1.80	1.60	2.90	1.40	2.00	‡1.00
25	2.20	2.20	2.10	4.20	3.20	2.90	1.70	1.60	2.90	1.40	1.90	1.40
26	2.10	2.20	2.10	4.20	2.80	2.70	1.70	1.60	2.40	1.40	1.90	1.30
27	2.00	2.10	2.20	4.20	3.30	2.80	1.60	1.60	3.10	1.40	1.80	1.30
28	2.00	2.00	3.10	4.30	3.10	†4.40	1.60	1.80	2.80	1.40	1.60	1.30
29	2.00	1.90	3.50	4.40	-------	3.60	1.60	2.60	2.50	1.40	1.50	1.20
30	2.00	1.80	3.50	3.50	-------	3.10	1.60	2.80	2.50	1.30	1.70	1.20
31	1.90	-------	3.40	2.60	-------	2.80	-------	2.40	-------	1.30	1.60	-------

NOTES—*Creek frozen December 14, 1916 to January 6, 1917; January 18 to 30 and February 3 to 25, 1917. †Maximum 6.90 feet at 2 p. m. estimated from hydrograph. ‡Minimum 1.00 feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.20	3.20	1.60	1.90	3.30	3.10	1.90	2.40	2.00	1.85	2.35	1.40
2	1.20	3.05	1.55	1.90	3.30	2.95	1.90	2.30	2.00	1.55	2.00	1.30
3	1.15	2.70	1.65	1.90	3.30	2.75	2.00	2.35	2.00	1.50	1.5	1.25
4	1.10	2.60	1.80	1.90	3.30	2.50	2.20	2.45	1.80	1.35	1.30	1.65
5	1.20	2.45	1.80	1.90	3.30	2.35	2.40	2.25	1.65	1.55	1.80	2.60
6	1.25	2.25	1.70	1.90	3.30	2.60	2.50	2.15	1.55	1.50	1.75	2.40
7	1.20	2.20	1.70	2.40	3.30	2.40	2.80	2.20	1.50	1.35	1.50	1.80
8	1.20	2.20	*1.85	2.40	3.30	2.30	2.90	2.10	1.35	1.30	1.50	1.55
9	1.15	2.05	2.65	2.40	3.30	2.20	3.35	1.95	1.30	1.30	1.45	1.40
10	1.10	2.00	2.80	2.40	3.30	2.60	3.45	1.90	1.50	1.30	1.35	1.20
11	1.10	2.00	2.80	2.50	3.20	2.50	3.60	‖1.9	1.90	1.30	1.30	1.20
12	1.25	1.85	2.80	2.80	3.20	2.35	2.50	1.90	2.20	1.30	1.30	1.15
13	1.75	1.80	2.80	3.15	3.70	2.40	2.50	1.85	1.80	1.30	1.30	1.40
14	1.50	1.75	2.60	3.60	3.95	3.05	2.35	2.45	2.25	1.30	1.30	1.50
15	1.40	1.70	2.40	3.70	4.25	3.25	3.30	2.60	2.40	1.30	1.30	1.50
16	1.40	1.65	2.40	3.80	4.85	3.25	3.90	2.60	2.05	1.45	1.30	1.35
17	1.40	1.60	2.35	3.80	5.60	3.20	3.50	2.80	1.70	1.70	1.30	1.15
18	1.25	1.60	2.15	3.80	5.45	3.15	2.80	2.45	1.55	1.55	1.30	1.30
19	1.20	1.45	2.05	3.80	4.40	3.05	3.70	2.40	1.45	1.50	1.20	2.85
20	2.00	1.40	2.05	3.80	5.55	2.85	3.80	2.25	1.25	1.40	1.20	2.85
21	1.85	1.60	1.90	3.70	4.50	2.70	3.40	2.05	1.40	1.40	1.10	2.50
22	1.75	1.80	1.90	3.65	4.35	2.50	3.25	2.00	2.10	1.30	1.10	1.50
23	1.65	2.05	1.90	3.55	4.25	2.85	3.05	2.45	2.35	1.20	‡1.00	1.50
24	2.25	2.25	1.90	3.45	3.85	2.20	3.00	2.50	1.90	1.35	‡1.05	1.40
25	2.60	2.60	1.90	3.30	2.90	2.20	2.95	2.35	1.70	1.85	1.15	1.30
26	2.50	2.50	1.90	3.30	3.25	2.20	2.65	2.25	1.50	1.85	1.20	1.25
27	2.40	2.35	1.90	3.30	3.60	2.10	2.60	2.00	1.45	1.45	1.20	‡1.05
28	2.00	2.25	1.80	3.30	3.25	2.00	2.40	2.00	1.40	1.40	1.20	1.40
29	2.25	1.90	1.80	3.30	-------	2.00	2.25	2.45	1.60	1.30	1.20	1.80
30	3.60	1.60	1.80	3.30	-------	2.00	2.10	2.35	1.80	1.70	1.15	1.95
31	†4.65	-------	1.90	3.30	-------	2.20	-------	2.20	-------	2.60	1.15	-------

NOTES—*Gage heights affected by ice December 8, 1917 to February 24, 1918. ‖Interpolated. †Maximum 5.8 feet at 2:00 a. m. ‡Minimum 1.00 feet.

SUSQUEHANNA BASIN—STATION NO. 10

FISHING CREEK AT BLOOMSBURG

DESCRIPTION OF STATION

Location.—At single span, wooden covered, highway bridge known as "Red Rock Bridge" at Bloomsburg, Columbia County.

Records Available.—Discharge measurements and gage heights from January 27, 1914, to September 30, 1918.

Drainage Area.—355 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge and is read twice daily by L. Norman Cox.

Channel.—Both beds are high and not subject to overflow, and the bed is composed of sand and gravel.

Discharge Measurements of Fishing Creek at Bloomsburg, Columbia County
(Drainage area 355 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
10	July 2	Brown & Heagy	476	3.68	558	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Fishing Creek at Bloomsburg, Columbia County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	3.63	3.30	3.81	3.67	3.94	3.99	5.83	3.24	4.07	3.78	3.12	3.26
2	3.49	3.14	3.68	3.62	3.68	3.87	4.96	3.28	3.93	3.70	3.44	3.21
3	3.43	3.21	3.61	3.61	*3.69	3.71	5.09	3.24	3.87	3.60	3.34	3.29
4	3.35	3.23	3.56	3.72	4.10	3.61	4.80	3.22	3.69	3.44	3.20	3.18
5	3.27	3.21	3.52	4.32	3.87	3.57	4.25	3.35	3.63	3.33	3.07	3.10
6	3.23	3.16	3.50	5.84	4.27	3.49	5.41	3.64	3.66	3.29	2.94	3.08
7	3.20	3.15	3.42	5.14	4.04	3.57	5.41	3.50	4.21	3.26	3.15	**3.02**
8	3.11	3.08	3.33	4.82	3.78	3.63	4.93	3.62	4.36	3.20	3.00	3.20
9	2.88	3.12	3.42	4.53	3.58	4.15	4.66	3.94	4.11	3.20	3.65	**3.21**
10	3.05	3.14	3.56	4.42	3.62	4.44	4.41	4.28	4.09	3.32	3.74	**3.12**
11	3.05	2.97	3.44	3.63	3.54	5.07	4.23	4.04	4.07	3.37	3.70	3.08
12	2.88	3.12	3.47	*3.59	3.50	5.26	4.13	3.91	4.31	3.34	3.42	3.05
13	2.75	3.06	3.43	3.74	3.61	4.75	4.01	3.74	4.01	3.42	3.29	2.97
14	3.21	3.10	3.28	5.61	3.51	4.43	3.92	3.66	3.88	3.34	5.95	2.96
15	3.19	3.09	3.24	5.52	3.48	4.45	3.81	3.58	3.79	3.36	4.76	2.80
16	3.17	3.10	3.27	5.03	3.47	4.14	3.72	3.51	4.05	3.30	4.16	2.92
17	3.05	3.06	*3.62	4.52	3.46	4.58	3.63	3.48	3.75	3.26	4.10	2.90
18	3.09	3.03	3.67	4.33	3.78	4.59	3.59	3.47	3.60	3.19	3.73	2.82
19	3.17	3.07	3.59	4.12	4.08	4.21	3.55	3.41	3.49	3.51	3.55	2.70
20	6.02	3.14	3.43	3.98	3.88	4.03	3.59	3.39	3.47	3.92	3.44	2.70
21	5.62	2.98	3.32	3.94	4.02	4.08	3.55	3.34	3.89	3.92	3.32	‡2.61
22	4.43	2.98	3.77	4.12	3.84	4.05	3.51	3.32	3.51	3.62	3.29	2.64
23	4.22	3.02	4.03	3.90	3.73	4.33	3.43	3.38	3.43	3.82	3.26	2.80
24	3.98	3.38	4.18	3.72	4.72	5.49	3.46	3.36	4.41	3.98	4.38	2.88
25	3.81	3.53	4.04	3.64	4.26	5.83	3.49	3.31	3.98	3.57	3.88	2.68
26	3.65	3.18	3.80	3.58	3.94	5.53	3.33	3.26	3.73	3.40	3.57	2.65
27	3.57	3.24	3.73	3.58	4.56	6.31	3.36	3.20	4.49	3.30	3.44	2.57
28	3.50	3.22	3.87	3.57	4.62	†7.67	3.37	3.28	4.25	3.24	3.31	2.78
29	3.42	3.22	3.94	3.64	-------	6.03	3.30	4.58	4.16	3.18	3.34	2.82
30	3.31	3.27	3.70	4.12	-------	5.33	3.25	4.43	4.07	3.28	3.33	2.72
31	3.30	-------	3.84	4.03	-------	4.95	-------	4.20	-------	3.16	3.34	-------

NOTES—*Creek frozen December 17, 1916 to January 5, 1917; January 12 to 14 and February 3 to 24, 1917 inclusive. †Maximum 8.90 feet at 4 a. m. estimated from hydrograph. ‡Minimum 2.46 feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.76	5.78	3.07	2.67	3.43	5.31	3.47	4.36	3.65	3.08	2.52	2.96
2	2.79	5.06	3.22	2.63	3.39	5.13	3.41	4.15	3.44	3.15	2.58	3.00
3	2.72	4.70	3.02	2.94	3.41	5.07	3.42	4.02	3.31	2.91	2.45	2.75
4	2.72	4.45	3.08	3.42	3.48	4.75	3.54	3.92	3.18	2.73	2.38	2.64
5	2.80	4.20	2.97	2.73	3.43	4.58	3.38	3.93	3.08	2.75	2.64	2.62
6	2.80	3.99	2.90	2.83	3.45	4.60	3.29	3.84	3.12	2.67	2.69	3.96
7	2.74	3.84	2.80	3.05	3.58	4.84	3.25	3.70	3.28	2.69	2.63	3.44
8	2.79	3.68	2.74	3.00	3.57	4.64	3.24	3.60	3.32	2.61	2.30	3.10
9	2.79	3.58	*3.32	3.10	3.40	4.55	3.93	3.48	3.16	2.63	2.47	3.04
10	2.73	3.54	3.15	2.99	3.40	6.63	4.37	3.42	3.08	2.62	2.46	2.88
11	2.86	3.52	3.14	3.09	3.39	5.21	4.48	3.41	3.28	2.62	2.57	2.84
12	2.82	3.38	3.06	3.14	3.31	4.94	4.43	3.30	3.61	2.61	2.70	2.78
13	3.05	3.32	3.12	3.23	4.24	4.98	4.38	3.31	3.44	2.72	2.71	2.90
14	2.95	3.24	3.04	3.29	5.23	9.34	5.13	3.58	3.21	2.72	3.55	3.20
15	2.92	3.24	3.16	3.54	8.19	7.84	6.58	3.36	3.24	2.59	3.40	2.98
16	2.71	3.18	3.05	3.84	8.59	6.19	6.40	3.22	3.12	2.59	**3.17**	**2.86**
17	2.82	3.13	3.06	3.79	7.39	5.37	6.15	3.16	3.04	2.61	2.82	2.90
18	2.70	3.10	3.10	3.77	6.59	5.10	6.53	3.17	2.97	2.63	2.80	3.02
19	2.90	3.06	3.14	3.54	6.99	4.93	5.48	3.06	2.86	2.59	2.73	3.47
20	4.00	3.06	3.14	3.55	8.94	5.09	4.96	3.04	2.82	2.59	2.52	**4.22**
21	3.72	3.02	2.96	3.56	6.93	5.21	5.26	3.69	2.93	2.55	2.69	**5.63**
22	3.31	3.07	2.96	3.53	5.55	5.03	6.27	3.44	3.22	2.46	2.41	**4.70**
23	3.22	3.09	2.84	3.60	4.99	4.81	5.74	3.48	3.34	2.45	2.61	**4.12**
24	4.39	3.10	2.80	3.56	**4.87**	4.45	**5.24**	**3.35**	3.18	2.46	**2.59**	**3.83**
25	5.28	3.10	2.95	3.59	5.33	4.29	**4.73**	3.28	3.06	2.69	2.36	3.63
26	4.40	3.10	2.96	3.49	8.49	4.06	4.44	3.22	2.97	2.81	2.25	**4.22**
27	4.40	2.99	2.89	3.51	6.55	3.95	4.23	3.18	2.90	2.71	2.58	**4.61**
28	4.62	2.94	2.86	3.59	5.67	3.77	4.04	3.74	2.71	2.33	‡2.14	4.21
29	4.31	2.96	2.84	3.55	-------	3.65	3.92	4.04	2.74	**2.57**	2.17	3.90
30	†10.29	3.08	2.58	3.46	-------	3.50	4.59	4.02	2.75	2.53	2.73	3.60
31	8.75	-------	2.75	3.50	-------	3.49	-------	3.83	-------	2.67	**2.73**	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 20, 1918. †Maximum 13.70 feet at 9 p. m. ‡Minimum 2.00 feet.

SUSQUEHANNA BASIN—STATION NO. 11

NORTH BRANCH SUSQUEHANNA RIVER AT DANVILLE

DESCRIPTION OF STATION

Location.—At seven span, steel, through truss, highway bridge between Danville and South Danville, Montour County.

Records Available.—Discharge complete from March 25, 1899, to December 31, 1903, and from March 23, 1905, to September 30, 1918. For other records on this river see North Branch Susquehanna River at Binghamton, N. Y., Towanda and Wilkes-Barre.

Drainage Area.—11,200 square miles.

Gage.—A standard chain gage, whose elevation of zero is 430.47 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by E. F. Bell.

Channel.—The right bank overflows in extreme stages, the left bank is high and does not overflow, and the bed is composed of rock and gravel.

Discharge Measurements of North Branch Susquehanna River at Danville, Montour County.
(Drainage area 11,200 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
40	Mar. 30	Reckord & Osman	14,487	13.77	81,360	Surface method
41	Mar. 31	Wilson & Osman	11,743	11.66	60,086	Surface method
42	Mar. 31	Wilson & Osman	11,102	11.12	56,066	Surface method
43	April 1	Wilson & Osman	9,480	9.83	43,752	Surface method
44	April 2	Wilson & Osman	8,456	9.02	37,759	Surface method
45	May 11	Reckord	6,005	7.06	24,034	Surface method
46	May 17	Reckord & Warlow	3,660	4.77	11,771	Surface method
47	July 2	Brown & Heagy	6,981	7.86	27,475	Surface method
48	Aug. 27	Reckord	4,970	6.08	17,937	Surface method
49	Aug. 28	Reckord	4,276	5.37	14,124	Surface method
50	Sept. 8	Brown	3,102	4.08	8,046	0.6 method
51	Sept.25	Wilson	2,069	3.00	3,767	0.2 & 0.8 method
52	Oct. 5	Reckord & Shade	1,924	2.70	3,011	0.2 & 0.8 method
	1918					
53	Jan. 25	Reckord & Shade	2,449	4.38	2,766	Under ice cover
54	Mar. 16	Wilson & Landis	20,063	18.09	133,498	Surface method
55	Mar. 16	Wilson & Landis	18,782	17.08	116,668	Surface method

Daily Mean Gage Heights, in feet, of North Branch Susquehanna River at Danville, Montour County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	3.6	3.2	4.6	5.5	4.4	6.4	9.7	4.1	8.4	8.3	5.8	††6.1
2	4.5	3.2	5.1	6.0	4.0	6.4	9.0	4.0	7.2	7.8	4.8	††5.6
3	4.4	3.1	5.6	6.6	3.6	6.3	10.1	4.0	6.8	7.9	4.3	††5.2
4	4.0	3.2	5.3	6.8	3.4	6.1	10.4	4.0	6.6	10.5	4.0	††6.0
5	3.6	3.3	5.0	6.4	3.3	5.5	10.2	4.2	6.1	8.8	4.0	††5.7
6	3.4	3.3	4.6	6.4	*	4.8	9.2	4.4	5.7	7.4	3.8	4.7
7	3.2	3.3	4.5	7.4	-------	4.3	8.8	4.7	5.4	6.6	3.8	4.2
8	3.2	3.2	4.4	7.0	-------	4.1	9.5	7.0	7.2	6.0	3.6	4.1
9	3.0	3.2	4.4	6.6	-------	4.5	9.4	7.2	10.8	5.5	3.9	4.0
10	2.9	3.4	4.4	6.2	-------	4.7	8.4	7.2	10.1	5.2	9.2	3.9
11	2.8	3.3	4.2	5.8	-------	5.1	7.5	7.0	9.4	5.4	10.2	4.3
12	2.8	3.2	4.1	5.4	-------	5.6	6.8	6.6	9.4	5.5	8.1	4.0
13	2.7	3.2	4.2	5.0	-------	9.6	6.4	6.0	9.9	5.4	6.2	3.8
14	2.8	3.4	4.2	7.2	-------	9.3	6.3	5.5	9.6	5.4	5.6	3.6
15	2.7	3.4	4.1	6.6	-------	7.7	6.2	5.2	8.8	5.8	5.5	3.4
16	2.7	3.4	3.6	7.0	-------	7.2	5.9	5.0	8.2	5.6	9.4	3.4
17	2.7	3.4	3.3	6.8	-------	6.9	5.6	4.8	7.8	6.0	8.1	3.2
18	2.8	3.6	3.2	6.6	-------	6.7	5.3	4.6	7.5	5.8	7.6	3.2
19	2.8	3.7	3.0	6.5	-------	6.6	5.1	4.4	6.8	5.5	6.2	3.1
20	3.5	3.6	2.9	5.8	-------	6.1	4.9	4.4	6.2	5.4	5.4	3.6
21	3.8	3.4	3.1	4.9	-------	5.6	4.8	4.2	6.4	6.2	4.7	3.0
22	4.0	3.4	3.3	5.0	-------	5.4	4.8	4.0	7.7	6.2	4.2	2.9
23	5.2	3.4	4.1	4.9	-------	6.0	4.9	4.0	8.8	7.0	4.0	3.2
24	5.3	3.6	4.3	4.4	-------	6.8	4.9	4.2	7.7	6.2	4.1	3.2
25	4.7	3.5	4.2	4.2	-------	10.0	4.7	4.2	7.6	5.4	5.6	3.0
26	4.2	3.7	4.2	4.1	-------	12.6	4.5	4.4	9.0	5.0	7.3	2.9
27	3.8	5.0	4.2	4.0	-------	12.7	4.3	4.2	8.2	4.8	6.2	2.8
28	3.6	4.8	4.4	3.7	-------	14.3	4.2	4.2	8.3	4.4	5.2	2.8
29	3.5	4.4	4.8	3.4	-------	†14.7	4.1	4.5	10.2	4.4	4.6	‡2.8
30	3.4	4.2	4.5	3.8	-------	13.5	4.1	7.2	9.0	4.3	4.2	2.7
31	3.3	-------	4.4	4.2	-------	11.4	-------	10.2	-------	4.8	4.9	-------

NOTES—*River frozen February 6 to 28, 1917, inclusive. †Maximum 14.8 feet at 6:30 a. m. ‡Minimum 2.7 feet September 29 and 30, 1917. ††Estimated.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.6	14.9	3.6	3.9	4.0	11.2	5.6	6.1	9.0	††3.4	2.7	††2.4
2	2.6	12.9	3.6	3.9	4.0	14.6	5.5	6.1	7.4	††3.4	2.6	††2.5
3	2.6	10.8	3.8	3.8	4.0	13.7	5.5	6.3	6.4	††3.6	2.6	††2.7
4	2.6	9.0	4.0	3.7	4.0	11.3	5.6	6.2	5.6	††3.7	2.6	††2.5
5	2.7	7.8	4.0	3.6	4.0	9.6	6.0	5.8	5.1	3.7	2.6	††2.4
6	2.7	7.0	4.0	3.6	4.0	8.6	6.4	5.6	4.7	3.7	2.6	††2.8
7	2.6	6.4	3.8	3.6	4.0	8.6	5.9	5.4	4.4	3.6	2.6	††2.9
8	2.8	5.9	3.6	3.7	4.0	9.7	5.4	5.2	4.3	3.4	2.6	3.0
9	3.0	5.6	*4.0	3.7	4.0	9.2	5.2	4.9	4.8	3.4	2.6	2.8
10	3.1	5.3	4.4	3.7	4.0	9.2	5.7	4.6	5.2	3.2	2.6	2.7
11	3.1	5.0	4.4	3.7	4.0	9.0	7.4	4.5	5.0	3.1	2.6	2.7
12	3.2	4.8	4.3	3.7	4.0	9.6	7.5	4.4	4.6	3.0	2.6	2.6
13	3.4	4.6	4.2	3.7	4.7	8.4	7.3	4.2	4.4	3.0	2.6	2.6
14	3.2	4.5	4.2	3.7	5.8	10.3	7.4	4.6	5.2	3.0	3.7	2.7
15	3.3	4.4	4.2	3.7	9.2	17.1	9.3	7.6	5.8	3.8	3.2	2.8
16	4.0	4.2	4.2	3.8	10.6	†17.5	13.8	8.4	5.2	4.0	3.0	2.8
17	3.8	4.1	4.2	3.7	9.4	12.1	15.4	7.0	4.7	3.8	2.8	2.8
18	3.7	4.0	4.3	3.8	7.6	10.1	14.2	6.0	4.3	3.6	2.8	2.8
19	4.1	3.9	4.3	3.8	6.9	9.6	13.2	5.4	4.0	3.4	2.8	3.0
20	4.2	3.8	4.3	3.8	9.8	9.9	11.4	4.9	3.8	3.4	2.6	3.5
21	4.6	3.8	4.3	3.9	13.8	10.4	9.8	4.8	3.6	3.2	2.6	4.9
22	7.1	3.8	4.4	3.9	13.6	10.8	9.6	5.6	3.6	3.2	2.5	5.9
23	6.2	3.8	4.4	3.9	10.6	10.9	9.6	6.8	3.8	3.1	2.40	5.9
24	5.6	4.0	4.4	3.9	9.5	10.6	9.6	6.5	4.6	3.1	2.40	5.2
25	6.8	4.2	4.2	4.0	8.5	9.8	9.2	6.6	5.0	3.1	2.30	4.6
26	11.7	4.6	4.2	4.0	10.0	8.8	8.4	6.0	4.6	3.0	2.30	4.3
27	10.4	4.3	4.2	4.0	12.7	7.8	7.6	5.6	4.2	2.9	2.30	4.6
28	9.4	4.0	4.2	4.0	12.3	7.3	6.8	6.9	3.9	3.1	‡2.25	5.8
29	9.4	3.8	4.0	4.0	-------	6.7	6.3	7.7	3.6	3.0	‡2.20	6.3
30	12.0	3.6	4.0	4.0	-------	6.2	6.2	7.3	3.5	2.9	‡2.20	5.8
31	16.2	-------	3.9	4.0	-------	5.8	-------	9.2	-------	2.8	2.30	-------

NOTES—††Estimated. *Gage heights affected by ice December 9, 1917 to February 15, 1918, and discharge estimated from one discharge measurement under ice cover together with climatological records. †Maximum 18.6 feet at 3:00 a. m. ‡Minimum 2.20 feet.

Daily discharge, in second-feet, of North Branch Susquehanna River at Danville, Montour County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	6,400	4,840	10,900	15,300	9,920	20,200	43,300	8,550	32,900	32,200	16,900	18,500
2	10,400	4,840	13,300	18,000	8,100	20,200	37,500	8,100	24,900	28,800	11,800	15,900
3	9,920	4,480	15,900	21,300	6,400	19,600	46,800	8,100	22,500	29,400	9,460	13,800
4	8,100	4,840	14,300	22,500	5,600	18,500	49,400	8,100	21,300	50,300	8,100	18,000
5	6,400	5,220	12,800	20,200	5,220	15,300	47,600	9,000	18,500	35,900	8,100	16,400
6	5,600	5,220	10,900	20,200	*4,840	11,800	39,100	9,920	16,400	26,200	7,220	11,300
7	4,840	5,220	10,400	26,200	4,480	9,460	35,900	11,300	14,800	21,300	7,200	9,000
8	4,840	4,840	9,920	23,700	4,480	8,550	41,600	23,700	24,900	18,000	6,400	8,550
9	4,120	4,840	9,920	21,300	5,600	10,400	40,800	24,900	53,000	15,300	7,660	8,100
10	3,780	5,600	9,920	19,100	6,800	11,300	32,900	24,900	46,800	13,800	39,100	7,660
11	3,460	5,220	9,000	16,900	6,000	13,300	26,800	23,700	40,800	14,800	47,600	9,460
12	3,460	4,840	8,550	14,800	5,220	15,900	22,500	21,300	40,800	15,300	30,800	8,100
13	3,140	4,840	9,000	12,800	4,840	42,400	20,200	18,000	45,000	14,800	19,100	7,220
14	3,460	5,600	9,000	24,900	4,480	39,900	19,000	15,300	42,400	14,800	15,900	6,400
15	3,140	5,600	8,550	21,300	4,120	28,100	19,100	13,800	35,900	16,900	15,300	5,600
16	3,140	5,600	6,400	23,700	3,950	24,900	17,500	12,800	31,500	15,900	40,800	5,600
17	3,140	5,600	5,220	22,500	3,780	28,100	15,900	11,800	28,800	18,000	30,800	4,840
18	3,460	6,400	4,840	21,300	4,120	21,900	14,300	10,900	26,800	16,900	27,500	4,840
19	3,460	6,800	4,120	20,800	4,480	21,300	13,300	9,920	22,500	15,300	19,100	4,480
20	6,000	6,400	3,780	16,900	4,480	18,500	12,200	9,920	19,100	14,800	14,800	4,120
21	7,220	5,600	4,480	12,300	4,840	15,900	11,800	9,000	20,200	19,100	11,300	4,120
22	8,100	5,600	5,220	12,800	4,840	14,800	11,800	8,100	28,100	19,100	9,000	3,780
23	13,800	5,600	8,550	12,300	4,660	18,000	12,300	8,100	35,900	23,700	8,100	4,840
24	14,300	6,400	9,460	9,920	5,600	22,500	12,300	9,000	28,100	19,100	8,550	4,840
25	11,300	6,000	9,000	9,000	9,460	45,900	11,300	9,000	27,500	14,800	15,900	4,120
26	9,000	6,800	9,000	8,550	10,400	70,300	10,400	9,920	37,500	12,800	25,500	3,780
27	7,220	12,800	9,000	8,100	11,800	71,300	9,460	9,000	31,500	11,800	19,100	3,460
28	6,400	11,800	9,920	6,800	14,300	88,400	9,000	9,000	32,200	9,920	13,800	3,460
29	6,000	9,920	11,800	5,600	-------	†93,000	8,550	10,400	47,600	9,920	10,900	‡3,460
30	5,600	9,000	10,400	7,220	-------	79,700	8,550	24,900	37,500	9,460	9,000	3,140
31	5,220	-------	9,920	9,000	-------	58,500	-------	47,600	-------	11,800	12,300	-------

NOTES—*River frozen February 6 to 28, 1917, inclusive, and discharge estimated from climatological data. †Maximum = 94,100 second-feet. ‡Minimum = 3,140 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2,800	94,200	6,170	2,030	2,400	56,300	15,600	18,300	37,700	5,380	3,080	2,270
2	2,800	72,500	6,170	2,030	2,400	90,800	15,100	18,300	26,200	5,380	2,800	2,530
3	2,800	52,700	7,000	1,920	2,400	80,800	15,100	19,400	20,000	6,170	2,800	3,080
4	2,800	37,700	7,870	1,810	2,270	57,200	15,600	18,900	15,600	6,500	2,800	2,530
5	3,080	28,900	7,870	1,700	2,270	42,500	17,800	16,700	13,100	6,580	2,800	2,270
6	3,080	23,600	7,870	1,700	2,270	34,600	20,000	15,600	11,200	6,580	2,800	3,370
7	2,800	20,000	7,000	1,700	2,270	34,600	17,200	14,600	9,730	6,170	2,800	3,670
8	3,370	17,200	6,170	1,920	2,270	43,300	14,600	13,600	9,250	5,380	2,800	3,980
9	3,980	15,600	*5,190	1,920	2,400	39,200	13,600	12,100	11,600	5,380	2,800	3,370
10	4,300	14,100	4,470	1,810	2,660	39,200	16,100	10,700	13,600	4,640	2,800	3,080
11	4,300	12,600	3,820	1,810	2,940	37,700	26,200	10,200	12,600	4,300	2,800	3,080
12	4,640	11,600	3,080	1,920	3,370	42,500	26,900	9,730	10,700	3,980	2,800	2,800
13	5,380	10,700	2,940	2,150	3,980	33,200	25,500	8,780	9,730	3,980	2,800	2,800
14	4,640	10,200	2,800	2,400	5,000	48,400	26,200	10,700	13,600	3,980	6,580	3,080
15	5,000	9,730	2,530	2,660	9,970	120,000	40,000	27,500	16,700	7,000	4,610	3,370
16	7,870	8,780	2,580	2,800	51,000	†125,000	81,900	33,200	13,600	7,800	3,980	3,370
17	7,000	8,320	2,400	2,800	40,800	64,500	99,900	23,600	11,200	7,000	3,370	3,370
18	6,580	7,870	2,400	2,800	27,500	46,600	83,300	17,800	9,250	6,170	3,370	3,370
19	8,320	7,430	2,530	2,800	22,300	42,500	75,600	14,600	7,870	5,380	3,370	3,980
20	8,780	7,000	2,660	2,800	44,100	45,000	58,100	12,100	7,000	5,380	2,800	5,770
21	10,700	7,000	2,940	2,800	81,900	49,200	44,100	11,600	6,170	4,640	2,800	12,100
22	24,200	7,000	3,080	2,800	79,800	52,700	42,500	15,600	6,170	4,640	2,530	17,200
23	18,900	7,000	3,080	2,800	51,000	53,600	42,500	22,400	7,000	4,300	2,270	17,200
24	15,600	7,870	3,080	2,800	41,700	51,000	42,500	20,600	10,700	4,300	2,270	13,600
25	22,400	8,780	2,940	2,770	33,900	44,100	39,200	21,200	12,600	4,300	2,030	10,700
26	69,800	10,700	2,800	2,660	45,800	36,100	33,200	17,800	10,700	3,980	2,030	9,250
27	49,200	9,250	2,660	2,660	70,400	28,900	27,500	15,600	8,780	3,670	2,030	10,700
28	40,800	7,870	2,530	2,530	66,500	25,500	22,400	23,000	7,430	4,300	‡1,920	16,700
29	40,800	7,000	2,400	2,530	-------	21,800	19,400	28,200	6,170	3,980	‡1,810	19,400
30	63,600	6,170	2,270	2,530	-------	18,900	18,900	25,500	5,770	3,670	‡1,810	16,700
31	109,000	-------	2,150	2,400	-------	16,700	-------	39,200	-------	3,370	2,030	-------

NOTES—*Gage heights affected by ice from December 9, 1917, to February 15, 1918 and discharge estimated from one discharge measurement under ice cover together with climatological records. †Maximum 139,000 second-feet from hydrograph at 3:00 a. m. ‡Minimum 1,810 second-feet.

Estimated Monthly Discharge of North Branch Susquehanna River at Danville, Montour County,
(Drainage area 11,200 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	14,300	3,140	6,270	0.65	0.65
November	12,800	4,480	6,210	0.55	0.61
December	15,900	3,780	9,140	0.82	0.94
January	26,200	5,600	16,300	1.46	1.68
February	----------	----------	6,170	0.55	0.57
March	†93,000	8,550	31,400	2.80	3.23
April	49,400	8,550	23,400	2.09	2.33
May	47,600	8,100	14,100	1.26	1.45
June	53,000	14,800	31,200	2.79	3.11
July	50,300	9,460	19,000	1.70	1.96
August	47,600	6,400	17,000	1.52	1.75
September	18,500	‡3,140	7,560	0.68	0.76
The year	93,000	3,140	15,700	1.40	19.04

NOTES—River frozen February 6 to 28, 1917, inclusive, and discharge estimated from climatological data. †Maximum=94,100 second-feet, March 29, 1917. ‡Minimum=3,140 second-feet, September 29 and 30, 1917.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	109,000	2,800	17,800	1.59	1.83
November	94,200	6,170	18,300	1.63	1.82
December	7,870	----------	3,980	0.36	0.42
January	----------	----------	2,350	0.21	0.24
February	81,900	----------	25,200	2.25	2.34
March	125,000	16,700	49,100	4.38	5.05
April	99,900	13,600	34,600	3.09	3.45
May	39,200	8,780	18,300	1.63	1.88
June	37,700	5,770	12,100	1.08	1.20
July	7,870	3,370	5,100	0.46	0.53
August	6,580	1,810	2,800	0.25	0.29
September	19,400	2,270	7,000	0.62	0.69
The year	125,000	1,810	16,300	1.46	19.74

NOTE—Gage heights affected by ice December 9, 1917 to February 15, 1918, and discharge estimated from one discharge measurement under ice cover to-gether with climatological records. Maximum 139,000 second-feet March 16. Minimum 1,810 second-feet August 28, 29 and 30.

SUSQUEHANNA BASIN—STATION NO. 12

WEST BRANCH SUSQUEHANNA RIVER AT BOWER

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge about four miles below Mahaffey, Clearfield County.

Records Available.—Discharge complete from October 2, 1913, to September 30, 1918. For other records on this river see West Branch Susquehanna River at Clearfield, Renovo, Williamsport and Lewisburg; also see West Branch Susquehanna River at Allenwood in the 1910-11 Report of the Water Supply Commission.

Drainage Area.—320 square miles.

Gage.—A standard chain gage, whose elevation of zero is 1,207.22 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by A. T. Bell.

Channel.—The right bank is low and subject to overflow at extreme stages; the left is high and not subject to overflow, and the bed is composed of gravel.

Discharge Measurement of West Branch Susquehanna River at Bower, Clearfield County.
(Drainage area 320 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
19	July 27	Bowen	368	4.58	127	0.2 & 0.8 method
	1918					
20	July 24	Reckord & Shade	354	4.57	120	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of West Branch Susquehanna River at Bower, Clearfield County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	4.4	4.6	5.8	5.9	7.9	6.4	6.1	5.0	5.9	5.5	4.3	4.7
2	4.2	4.6	5.4	5.8	6.8	6.1	6.0	5.0	5.8	5.8	4.2	4.7
3	4.2	4.4	5.3	5.9	5.7	5.8	6.1	4.9	5.6	5.6	4.9	4.4
4	4.12	4.2	5.3	7.0	5.7	5.6	5.8	5.0	5.5	5.2	4.5	4.3
5	4.2	4.6	5.2	7.9	5.8	5.4	5.8	5.8	5.3	5.2	4.3	4.3
6	4.08	4.6	5.1	9.2	5.8	5.5	6.7	6.2	5.9	5.0	4.2	4.4
7	4.04	4.6	5.0	7.7	5.7	5.5	6.8	5.9	8.2	5.1	4.2	5.5
8	3.98	4.5	5.0	6.9	5.5	6.0	7.2	6.0	8.0	4.9	4.5	8.3
9	4.00	4.5	5.1	6.6	5.5	6.3	6.8	6.1	7.1	5.6	5.6	7.0
10	4.02	4.9	5.0	6.5	*	5.9	6.5	6.0	6.8	5.8	4.8	6.1
11	3.98	4.9	4.7	6.4	-------	7.2	6.2	5.7	6.4	6.4	4.5	5.6
12	3.99	4.7	5.0	5.9	-------	9.8	6.0	5.6	6.0	5.8	4.4	5.4
13	‡4.02	4.7	4.7	5.6	-------	7.9	5.7	5.5	5.7	6.4	4.4	5.2
14	4.4	4.7	*	5.7	-------	7.7	5.6	5.3	5.5	5.8	9.3	5.0
15	4.3	4.8	-------	5.5	-------	7.6	5.6	5.2	5.4	5.7	7.2	4.8
16	4.3	4.7	-------	5.6	-------	6.9	5.5	5.1	5.3	5.6	6.4	4.8
17	4.2	4.7	-------	5.4	-------	7.0	5.3	5.0	5.2	5.9	5.8	4.7
18	4.2	4.6	-------	*	-------	7.1	5.2	5.0	5.0	5.7	5.4	4.6
19	5.2	4.6	-------	-------	-------	6.4	5.2	5.0	5.0	5.8	5.1	4.6
20	5.7	4.5	-------	-------	-------	6.3	5.4	4.9	4.8	5.4	4.8	4.5
21	5.7	4.5	-------	-------	-------	6.4	5.3	4.8	4.7	5.1	4.7	4.5
22	5.3	4.4	-------	†	-------	6.6	5.1	4.8	4.6	5.0	4.6	4.5
23	5.0	4.4	-------	8.8	-------	6.8	5.0	5.1	4.6	5.3	4.6	4.4
24	4.8	5.1	-------	7.5	-------	8.7	5.1	5.1	6.0	4.9	5.2	4.3
25	4.6	4.7	-------	6.8	-------	7.8	5.0	5.0	5.3	4.8	5.1	4.3
26	4.6	4.9	-------	6.4	-------	7.2	5.2	4.9	4.9	4.7	5.0	4.3
27	4.5	5.3	-------	5.6	7.7	6.8	5.1	4.8	6.5	4.6	4.5	4.3
28	4.4	5.1	-------	6.0	7.0	7.0	5.0	4.9	6.0	4.6	4.4	4.2
29	4.4	5.9	7.6	5.7	-------	6.8	4.9	6.0	6.0	4.4	4.4	4.3
30	4.3	6.2	6.7	6.5	-------	6.6	4.9	6.1	5.7	4.4	4.9	4.3
31	4.3	-------	6.2	7.0	-------	6.3	-------	5.7	-------	4.3	4.9	-------

NOTES—*River frozen December 14 to 28, 1916; January 18 to the morning of the 22nd and February 10 to 26, 1917, inclusive. †Maximum estimated 11.1 feet at 3:00 p. m. ‡Minimum 3.90 feet at 7:30 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	4.3	6.5	4.9	5.8	5.5	7.3	4.8	5.2	7.1	4.6	4.2	7.6
2	4.3	6.2	4.9	5.8	5.5	7.3	4.8	5.1	6.4	4.5	4.12	6.4
3	4.3	6.0	4.5	5.7	5.5	6.9	4.8	5.0	5.9	4.4	4.01	5.8
4	4.7	5.9	4.7	5.6	5.7	6.4	5.0	4.9	5.3	4.3	3.93	5.6
5	4.9	5.5	4.7	5.5	5.7	6.6	4.8	4.9	5.4	4.2	7.0	5.4
6	4.6	5.4	4.6	5.6	5.7	7.0	4.7	4.9	5.3	4.19	5.1	5.2
7	4.5	5.2	*4.7	5.8	5.9	7.2	4.7	4.8	5.7	4.15	4.6	4.9
8	4.4	5.1	4.3	5.9	6.3	6.6	4.8	4.8	5.4	4.11	7.0	4.6
9	4.4	5.1	4.8	5.8	6.8	6.5	5.8	4.7	5.1	4.12	6.6	4.7
10	4.3	5.0	4.9	5.7	7.6	8.3	5.7	4.6	5.0	4.12	6.5	4.6
11	4.3	5.0	4.8	5.7	8.4	7.1	5.7	4.6	5.3	4.13	5.5	4.5
12	4.4	4.9	4.8	5.7	9.4	6.9	5.6	4.8	5.0	4.08	5.2	5.2
13	4.6	4.9	4.9	5.7	10.6	6.8	5.8	5.0	5.0	4.13	4.9	7.1
14	4.6	4.8	4.9	5.7	9.6	9.6	7.4	5.4	4.8	4.11	4.6	6.0
15	4.8	4.8	5.0	5.7	10.1	9.0	8.6	5.2	4.7	4.05	4.8	5.6
16	5.1	4.8	5.1	5.6	8.5	7.8	8.6	5.0	4.6	4.01	4.4	5.3
17	4.8	4.7	5.0	5.6	7.3	7.0	8.0	5.0	5.2	4.03	4.5	7.1
18	4.7	4.7	5.0	5.6	6.4	6.5	7.4	4.9	5.0	4.09	4.4	7.0
19	6.9	4.6	5.0	5.6	7.6	6.2	7.8	4.8	4.7	4.11	4.2	6.9
20	8.0	4.6	4.9	5.5	†13.0	6.0	6.6	5.0	4.6	4.03	4.08	7.6
21	6.6	4.6	5.0	5.5	9.0	5.8	6.5	6.4	4.9	3.99	4.00	7.4
22	6.2	4.7	5.7	5.4	7.4	5.6	6.3	6.2	5.6	3.91	4.12	6.3
23	5.8	4.8	6.0	5.3	7.0	5.4	6.0	7.1	5.1	3.95	4.04	5.9
24	5.5	4.6	5.8	5.3	6.4	5.4	5.9	6.4	4.8	4.4	‡3.88	5.6
25	7.3	4.5	6.7	5.3	7.0	5.3	5.7	6.5	4.6	4.4	3.92	5.5
26	8.1	4.4	6.9	5.4	10.3	5.2	5.5	8.7	4.6	4.2	3.92	5.5
27	8.4	4.3	6.7	5.5	8.5	5.1	5.4	7.0	4.5	4.15	3.95	5.3
28	8.9	4.5	6.5	5.5	7.4	5.0	5.3	7.5	4.6	4.09	3.91	5.3
29	7.8	4.6	6.3	5.5	-------	4.9	5.2	6.8	5.0	3.95	7.0	5.2
30	7.5	4.6	6.1	5.5	-------	4.9	5.2	8.5	4.8	4.3	6.0	5.4
31	7.3	-------	5.8	5.5	-------	4.8	-------	7.8	-------	4.3	6.0	-------

NOTES—*Gage heights affected by ice December 7, 1917 to February 13, 1918 and discharge estimated from climatological records. †Maximum 13.8 feet at 4:00 a. m. ‡Minimum 3.72 feet.

Daily discharge, in second-feet, of West Branch Susquehanna River at Bower, Clearfield County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	93	123	508	562	2,380	876	681	204	562	366	81	141
2	71	123	324	508	1,190	681	619	204	508	508	71	141
3	71	93	292	562	456	508	681	180	408	408	180	93
4	64	81	288	1,380	456	408	508	204	366	258	107	81
5	71	159	258	2,380	508	324	508	508	288	258	81	81
6	61	123	231	4,450	508	366	1,100	744	562	204	71	93
7	58	123	204	2,130	456	366	1,190	562	2,800	231	71	366
8	55	107	204	1,280	366	619	1,580	619	2,520	180	107	2,940
9	56	81	231	1,630	366	810	1,190	681	1,480	408	408	1,380
10	57	180	204	948	*324	562	948	619	1,190	508	159	681
11	55	180	141	876	258	1,580	744	456	876	876	107	408
12	55	141	204	562	204	5,560	619	408	619	508	93	324
13	‡57	141	141	408	180	2,380	456	366	456	876	93	258
14	93	141	*107	456	141	2,130	408	288	366	508	4,930	204
15	81	159	81	366	159	2,610	408	258	324	456	1,580	159
16	81	141	71	408	159	1,280	366	231	288	408	876	159
17	71	141	71	324	141	1,380	288	204	258	562	508	141
18	71	123	66	*258	141	1,480	258	204	204	456	324	123
19	258	123	62	231	204	876	258	204	204	508	231	123
20	456	107	62	204	288	810	324	180	159	324	159	107
21	456	107	59	204	324	876	288	159	141	231	141	107
22	288	93	71	†1,380	288	1,030	231	159	123	204	123	107
23	204	93	93	3,720	258	1,190	204	231	123	288	123	93
24	159	231	81	1,890	681	3,550	231	231	619	180	258	81
25	123	141	76	1,190	1,380	2,250	204	204	288	159	231	81
26	123	180	71	876	1,786	1,580	258	180	180	141	204	81
27	107	288	93	408	2,130	1,190	231	159	948	123	107	81
28	93	231	948	619	1,380	1,380	204	180	619	123	93	71
29	93	562	2,010	456	-------	1,190	180	619	619	93	93	81
30	81	744	1,100	948	-------	1,030	180	681	456	93	180	81
31	81	-------	744	1,380	-------	810	-------	456	-------	81	180	-------

NOTES—*River frozen December 14 to 28, 1916; January 18 to the morning of the 22nd, and February 10 to 26, 1917, inclusive, and discharge estimated from climatological records. †Maximum = 8,070 second-feet. ‡Minimum = 50 second-feet .Discharges above 4,080 second-feet are estimated.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	81	1,000	181	81	56	1,740	160	260	1,540	123	71	2,060
2	81	780	181	81	56	1,740	160	220	925	107	65	925
3	81	645	107	81	56	1,360	160	204	580	93	57	520
4	141	580	141	81	59	925	204	181	294	81	52	415
5	181	370	141	76	71	1,090	160	181	330	71	1,450	330
6	123	330	123	76	87	1,450	141	181	294	70	230	260
7	107	260	*93	76	107	1,640	141	160	465	67	123	181
8	93	230	63	71	150	1,090	160	160	330	64	1,450	123
9	93	230	53	71	204	1,000	520	141	230	65	1,090	141
10	81	204	47	71	294	2,880	465	123	204	65	1,000	123
11	81	204	45	71	645	1,540	465	123	294	65	370	107
12	93	181	45	71	1,640	1,360	415	160	204	62	260	260
13	123	181	45	71	3,130	1,260	520	204	204	65	181	1,540
14	123	160	45	71	4,600	4,600	1,840	330	166	64	123	615
15	160	160	45	67	5,310	3,780	3,260	260	141	60	160	415
16	230	160	45	67	3,130	2,280	3,260	204	123	57	93	294
17	160	141	45	67	1,740	1,450	2,520	204	260	58	107	1,540
18	141	141	47	67	925	1,000	1,840	181	294	62	33	1,450
19	1,360	123	56	67	2,060	780	2,280	160	141	64	71	1,260
20	2,520	123	66	63	†9,530	645	1,090	204	123	58	62	2,060
21	1,090	123	81	63	3,780	520	1,000	925	181	55	56	1,840
22	780	141	100	63	1,840	415	850	780	415	51	65	850
23	520	160	115	63	1,450	330	645	1,540	230	53	59	580
24	370	123	115	63	925	330	580	925	160	93	‡49	415
25	1,740	107	115	63	1,450	294	465	1,000	123	93	51	370
26	2,640	93	107	59	5,610	260	370	3,390	123	71	51	370
27	3,000	81	107	59	3,130	230	330	1,450	107	67	53	294
28	3,650	107	100	59	1,840	204	294	1,950	123	62	51	294
29	2,280	123	100	59	-------	181	260	1,260	204	53	1,450	260
30	1,950	123	93	56	-------	181	260	3,130	160	81	645	330
31	1,740	-------	87	56	-------	160	-------	2,280	-------	81	645	-------

*Gage heights affected by ice December 7, 1917 to February 13, 1918, and discharge estimated from climatological records. †Maximum ††10,700 second-feet from hydrograph at 4:00 a. m. ‡Minimum 43 second-feet. ††Estimated.

Estimated Monthly Discharge of West Branch Susquehanna River at Bower, Clearfield County.
(Drainage area 320 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	456	‡55	121	0.38	0.44
November	744	81	175	0.55	0.61
December	2,010		293	0.92	1.06
January	†4,450		1,040	3.25	3.75
February	2,380		611	1.91	1.99
March	5,560	324	1,320	4.13	4.76
April	1,580	180	512	1.60	1.78
May	744	159	341	1.07	1.23
June	2,800	123	618	1.93	2.15
July	876	81	340	1.06	1.22
August	4,930	71	386	1.21	1.40
September	2,940	71	296	0.92	1.03
The year	5,560	55	506	1.58	21.42

NOTES—River frozen December 14 to 28, 1916; January 18 to morning of the 22nd, and February 10 to 26, 1917, inclusive, and discharge estimated from climatological records. †Maximum =8,070 second-feet, January 22, 1917. ‡Minimum=50 second-feet, October 13, 1916. Discharges above 4,080 second-feet are estimated.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	3,650	81	833	2.60	3.00
November	1,000	81	246	0.77	0.86
December	181		88	0.28	0.32
January			68	0.21	0.24
February	††9,530		1,920	6.00	6.25
March	4,600	160	1,180	3.69	4.25
April	3,260	141	827	2.58	2.88
May	3,390	123	725	2.27	2.62
June	1,540	107	296	0.92	1.03
July	123	51	70	0.22	0.25
August	1,450	49	332	1.04	1.20
September	2,060	107	678	2.12	2.36
The year	††9,530		596	1.86	25.26

NOTES—Gage heights affected by ice December 7, 1917, to February 13, 1918, and discharge estimated from climatological data. ††Estimated. Maximum ††10,700 second-feet February 20. Minimum 43 second-feet August 24.

SUSQUEHANNA BASIN—STATION NO. 13

WEST BRANCH SUSQUEHANNA RIVER AT CLEARFIELD

DESCRIPTION OF STATION

Location.—At two span, steel, through truss, highway bridge at Market Street, Clearfield, Clearfield County.

Records Available.—Gage heights from October 2, 1913, to September 30, 1918. For other records on this river see West Branch Susquehanna River at Bower, Renovo, Williamsport and Lewisburg: also West Branch Susquehanna River at Allenwood in the 1910-11 Report of the Water Supply Commission.

Drainage Area.—487 square miles.

Gage.—A staff gage, whose elevation of zero is 1,093.30 feet above mean sea level, is located on the downstream side of the pier and is read twice daily by H. P. Bridge.

Channel.—Both banks are high and not subject to overflow.

Remarks.—The U. S. Weather Bureau has observed gage heights at this station since May 1, 1902.

Daily Mean Gage Heights, in feet, of West Branch Susquehanna River at Clearfield, Clearfield County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.4	0.5	1.9	*	2.8	2.4	1.9	1.2	1.8	1.6	0.8	1.0
2	0.4	0.9	1.8	1.8	2.8	2.0	1.8	1.2	1.8	1.5	0.7	1.0
3	0.4	0.9	1.7	1.6	*	1.8	2.0	1.2	1.7	1.4	0.6	0.9
4	0.3	0.8	1.6	2.1		1.8	1.9	1.1	1.6	1.4	0.6	0.8
5	0.3	1.0	1.5	2.7		1.6	1.8	1.4	1.6	1.2	0.5	0.7
6	0.2	1.0	1.4	4.4		*	2.4	2.1	1.7	1.2	0.5	0.6
7	0.2	0.9	1.3	3.2			2.6	2.2	2.8	1.1	0.4	1.1
8	0.2	0.8	1.2	2.7		1.6	2.7	2.0	3.7	1.1	0.3	2.0
9	0.2	0.8	1.2	2.2		1.8	2.6	2.0	2.8	1.4	1.6	2.6
10	0.2	0.9	1.2	2.1		1.8	2.4	2.0	2.6	2.0	1.3	1.9
11	0.2	1.2	1.2	2.0		2.2	2.0	2.0	2.6	2.0	1.0	1.6
12	0.2	1.1	1.1	*		5.0	1.8	1.9	2.2	1.9	0.8	1.4
13	‡0.1	1.0	1.0			3.8	1.7	1.8	1.8	1.8	0.8	1.2
14	0.2	1.0	*			3.1	1.7	1.7	1.6	1.8	3.5	1.1
15	0.3	1.0				3.2	1.6	1.6	1.5	1.8	3.0	1.0
16	0.4	1.0				2.6	1.6	1.5	1.4	1.7	1.9	0.9
17	0.4	0.9				2.6	1.5	1.4	1.4	1.6	1.4	0.8
18	0.3	0.9				2.8	1.4	1.3	1.2	1.6	1.4	0.8
19	0.6	0.9				2.4	1.4	1.2	1.2	1.6	1.2	0.7
20	2.0	0.8				2.2	1.4	1.2	1.1	1.6	1.1	0.6
21	1.8	0.8				2.0	1.4	1.2	1.1	1.4	1.0	0.6
22	1.4	0.7		†4.2		2.1	1.4	1.1	1.0	1.3	1.0	0.6
23	1.2	0.7		4.4		2.4	1.3	1.2	0.9	1.2	0.9	0.6
24	1.0	1.2		3.6		3.7	1.3	1.3	1.2	1.1	0.9	0.5
25	1.0	1.8		2.8	2.3	3.4	1.3	1.2	1.4	1.0	1.1	0.5
26	1.0	1.7		2.4	2.3	2.9	1.3	1.2	1.2	0.9	1.0	0.4
27	0.9	1.7		*	3.0	2.6	1.3	1.1	2.0	1.0	0.9	0.4
28	0.8	1.5	3.1		3.0	2.7	1.3	1.1	1.8	1.0	0.8	0.4
29	0.7	1.6	3.4			2.4	1.3	1.5	2.0	1.0	0.7	0.4
30	0.6	2.0	2.8	2.0		2.2	1.3	1.8	2.2	0.9	1.0	0.4
31	0.6		2.4	2.4		2.0		1.7		0.8	1.3	

NOTES—*River frozen December 13 to 1:30 p. m. December 28, 1916; January 1; January 12 to 21; January 27 to 30; February 3 to 25, and March 6 and 7, 1917, inclusive. †Maximum estimated 5.7 feet at 8:00 p. m. ‡Minimum 0.1 feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.4	2.3	0.9			2.9	1.0	1.3	2.8	1.1	1.1	3.5
2	0.4	2.1	1.0			3.0	0.9	1.2	2.4	0.8	1.1	2.3
3	0.4	1.8	1.2			2.6	0.9	1.2	2.0	0.6	1.1	1.8
4	0.7	1.6	1.0			2.2	1.0	1.1	1.6	0.4	1.1	1.6
5	1.1	1.5	0.9			2.2	1.0	1.1	1.6	0.3	1.3	1.5
6	1.1	1.5				2.4	0.9	1.1	1.5	0.2	2.0	1.4
7	1.0	1.4				2.8	0.8	1.0	2.2	0.2	1.4	1.4
8	0.8	1.3				2.4	0.8	1.0	2.0	0.2	1.6	1.4
9	0.8	1.3				2.2	1.5	1.0	1.6	0.1	2.0	1.3
10	0.7	1.2				3.4	1.6	0.9	1.4	0.1	1.9	1.2
11	0.7	1.2				3.0	1.5	0.9	1.5	0.1	1.7	1.2
12	0.6	1.1			3.1	2.6	1.6	0.9	1.6	0.1	1.5	1.3
13	0.7	1.1			5.4	2.4	1.7	1.1	1.4	0.1	1.4	2.3
14	0.8	1.1			4.7	4.6	2.6	1.6	1.3	0.1	1.4	2.2
15	1.0	1.0			4.8	5.0	3.7	1.4	1.2	0.1	1.4	1.8
16	1.2	1.0			4.2	3.4	3.7	1.3	1.0	‡0.0	1.4	1.6
17	1.2	1.0			4.1	2.8	3.2	1.2	1.0	‡0.0	1.4	1.8
18	1.0	0.9			3.2	2.4	3.2	1.2	1.2	‡0.0	1.3	2.6
19	1.6	0.9			2.8	2.0	2.8	1.1	1.0	‡0.0	1.2	2.2
20	3.7	0.9			†8.2	1.8	2.2	1.1	0.9	‡0.0	1.1	2.9
21	2.6	0.8			5.2	1.8	2.1	1.8	0.8	‡0.0	1.0	2.6
22	2.2	0.8			3.4	1.7	2.0	2.2	1.6	‡0.0	1.0	2.2
23	1.8	0.8			2.6	1.6	1.9	2.5	1.4	0.8	1.0	2.0
24	2.5	0.8			2.3	1.5	1.8	2.4	1.2	1.0	1.0	1.8
25	3.7	*			2.6	1.4	1.6	2.0	1.0	1.3	1.0	1.7
26	3.8				5.7	1.3	1.5	3.5	0.8	1.0	1.0	1.6
27	3.8				4.0	1.3	1.4	3.2	0.6	1.0	1.0	1.5
28	4.2				3.1	1.2	1.4	3.3	0.5	1.0	1.0	1.4
29	3.7					1.1	1.3	2.7	2.0	1.0	1.6	1.4
30	3.0					1.1	1.3	3.7	1.6	1.1	2.2	1.3
31	2.8					1.0		3.4		1.2	1.7	

NOTES—*Gage heights affected by ice November 25, 1917, to February 13, 1918. †Maximum 9.7 feet at 11:00 a. m. ‡Minimum 0.00 feet.

SUSQUEHANNA BASIN—STATION NO. 14

CLEARFIELD CREEK AT DIMELING

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge at Dimeling, Clearfield County.

Records Available.—Discharge complete from October 2, 1913, to September 30, 1918.

Drainage Area.—370 square miles.

Gage.—A standard chain gage, whose elevation of zero is 1,145.56 feet above mean sea level, is located on the upstream side of the bridge and is read twice daily by G. S. Stover.

Channel.—The right bank is low and subject to overflow at extreme stages; the left is high and not subject to overflow, and the bed is composed of gravel.

Remarks.—Little Clearfield Creek enters about 400 feet upstream.

Discharge Measurement of Clearfield Creek at Dimeling, Clearfield County.
(Drainage area 370 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
			Sq. ft.	Feet	Sec.-ft.	
21	1917 July 29	Bowen,	261	4.22	154	0.2 & 0.8 method
22	1918 July 25	Reckord & Shade	239	4.29	124	0.6 method

Daily Mean Gage Heights, in feet, of Clearfield Creek at Dimeling, Clearfield County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	3.90	3.90	5.2	5.3	6.3	-------	6.0	4.58	5.4	5.9	4.03	4.01
2	3.83	4.08	5.1	5.4	5.6	-------	6.2	4.56	5.8	5.4	4.08	3.96
3	3.72	3.94	5.0	5.4	5.3	-------	5.9	4.52	5.7	5.1	4.26	3.81
4	3.66	4.00	4.78	5.8	*	-------	5.7	4.79	5.5	4.87	4.26	3.82
5	3.68	4.16	4.56	6.8	-------	-------	5.5	5.4	5.3	4.65	4.10	3.72
6	3.61	4.07	4.44	8.6	-------	-------	6.9	6.5	5.6	4.66	3.96	3.88
7	3.53	4.00	4.32	7.2	-------	-------	7.0	6.6	7.3	5.0	3.98	3.89
8	‡3.49	3.93	4.25	6.4	-------	-------	7.1	6.3	8.6	4.80	4.28	6.0
9	3.53	3.96	4.26	6.6	-------	-------	6.8	6.5	6.8	6.3	4.73	5.8
10	3.54	4.05	4.43	6.8	-------	-------	6.4	6.4	6.9	6.7	4.32	5.1
11	3.52	4.04	4.22	7.2	-------	6.5	6.0	6.0	7.3	7.3	4.12	4.73
12	3.54	4.00	4.19	7.2	-------	†10.0	5.9	5.8	6.9	6.5	4.04	4.52
13	3.56	3.96	4.17	7.1	-------	7.7	5.8	5.6	6.7	6.8	4.07	4.40
14	3.64	4.00	4.24	*	-------	7.2	5.6	5.4	6.4	6.3	6.7	4.23
15	3.61	3.98	4.26	-------	-------	7.2	5.4	5.4	5.5	5.7	6.0	4.15
16	3.61	4.00	*	-------	-------	6.5	5.4	5.4	5.6	5.5	5.1	4.10
17	3.66	3.87	-------	-------	-------	6.5	5.2	5.3	5.3	5.6	4.72	4.05
18	3.62	3.82	-------	-------	-------	6.7	4.96	5.2	4.98	5.4	4.52	4.00
19	4.16	3.82	-------	-------	-------	6.3	5.2	5.0	4.80	5.5	4.38	3.97
20	5.2	3.78	-------	-------	-------	6.0	5.2	5.0	4.68	5.2	4.21	3.93
21	5.3	3.78	-------	-------	-------	5.9	5.1	4.98	4.62	4.92	4.08	3.89
22	5.0	3.74	-------	-------	-------	6.0	4.94	4.98	4.43	5.1	4.20	3.88
23	4.80	3.84	-------	7.9	-------	6.4	4.84	4.97	4.38	4.91	4.12	3.86
24	4.54	4.77	-------	7.3	-------	8.2	4.73	5.2	5.1	4.70	4.40	3.80
25	4.35	4.79	-------	6.4	-------	7.6	4.69	5.0	5.1	4.63	4.24	3.88
26	4.08	4.56	-------	5.7	-------	6.9	4.77	5.0	4.66	4.54	4.14	3.75
27	3.89	4.42	-------	5.3	-------	6.6	4.81	4.98	5.4	4.60	4.02	3.82
28	3.76	4.34	-------	5.2	-------	6.6	4.58	4.94	5.2	4.39	4.00	3.75
29	3.74	4.76	5.9	5.4	-------	6.4	4.62	5.3	6.1	4.24	3.94	3.74
30	3.78	5.1	5.6	5.4	-------	6.3	4.56	6.0	5.5	4.15	4.08	3.86
31	3.79	-------	5.4	6.2	-------	6.0	-------	5.5	-------	4.09	4.10	-------

NOTES—*Creek frozen December 16 to 28, 1916; January 14 to 22 and February 4 to March 10, 1917, inclusive. †Maximum 10.5 feet at 7 a.m. ‡Minimum 3.49 feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	3.75	6.3	4.28	5.3	5.2	6.9	4.54	4.97	6.9	4.66	4.19	6.8
2	‡3.71	6.1	4.31	5.2	5.2	6.7	4.52	4.86	6.3	4.38	3.90	5.5
3	3.70	5.6	4.20	5.2	5.2	6.4	4.50	4.76	5.8	4.18	3.76	5.0
4	3.82	5.4	4.28	5.2	5.2	6.2	4.54	4.66	5.4	4.06	3.68	4.80
5	3.93	5.2	4.26	5.2	5.2	6.2	4.58	4.60	5.3	4.01	5.2	4.66
6	3.95	5.1	4.20	5.2	5.2	6.8	4.43	4.74	5.1	3.96	5.9	4.62
7	3.88	4.94	4.16	5.2	5.2	6.7	4.46	4.56	5.3	3.92	4.64	4.55
8	3.83	4.84	4.04	5.3	5.2	6.3	4.95	4.50	5.3	3.88	4.34	4.38
9	3.76	4.78	*3.90	5.3	5.2	6.1	4.97	4.46	5.1	3.91	5.0	4.20
10	3.68	4.66	3.89	5.4	6.3	6.5	5.1	4.42	4.70	3.84	4.72	4.08
11	3.83	4.60	4.54	5.3	7.1	7.2	5.2	4.40	4.65	3.77	4.62	4.05
12	3.95	4.55	4.63	5.3	9.1	6.8	5.4	4.34	4.78	3.83	4.51	4.52
13	3.94	4.50	4.64	5.4	11.1	6.8	6.2	4.40	4.61	3.86	4.50	6.2
14	3.85	4.46	4.52	5.4	8.7	9.6	6.8	4.75	4.46	3.78	4.31	5.8
15	3.90	4.40	4.55	5.4	8.8	9.2	††7.3	4.52	4.42	3.74	4.36	5.1
16	4.06	4.36	4.64	5.4	8.1	7.6	††7.6	4.36	4.32	3.80	4.46	4.84
17	3.99	4.24	4.58	5.4	7.1	7.0	††7.8	4.31	4.48	††3.8	4.12	6.6
18	3.96	4.25	4.56	5.4	6.2	6.4	7.9	4.22	5.0	††3.8	4.02	6.6
19	5.1	4.23	4.60	5.3	6.5	5.7	7.4	4.20	4.48	††3.8	3.93	5.8
20	6.6	4.15	4.66	5.3	†10.7	5.6	7.0	4.38	4.25	††3.8	3.90	6.3
21	5.6	4.16	4.70	5.3	9.3	5.5	6.8	6.0	4.20	††3.8	3.87	6.2
22	5.1	4.18	4.73	5.3	7.2	5.3	6.5	6.1	5.2	††3.8	3.80	5.8
23	4.64	4.23	4.98	5.3	6.4	5.3	6.1	6.7	4.75	††3.8	3.85	5.4
24	6.0	4.17	5.1	5.3	6.5	5.2	5.8	6.3	4.58	††4.1	3.86	5.2
25	7.8	4.07	5.3	5.3	7.2	5.0	5.6	6.2	4.37	4.26	3.83	5.1
26	7.7	*4.26	6.3	5.3	10.2	4.94	5.4	7.9	4.27	3.92	3.75	5.0
27	7.9	4.28	6.4	5.3	8.8	4.84	5.3	7.0	4.21	3.80	3.79	4.98
28	7.9	4.30	6.0	5.3	7.5	4.76	5.1	7.9	4.24	3.68	3.75	4.80
29	7.4	4.22	5.8	5.3	-------	4.72	5.0	6.9	5.8	‡3.62	5.5	4.62
30	7.1	4.21	5.8	5.3	-------	4.64	5.0	7.8	5.0	3.78	5.1	4.48
31	7.0	-------	5.4	5.2	-------	4.61	-------	7.9	-------	4.21	4.86	-------

NOTES—*Gage heights affected by ice November 26 to 30, 1917; December 9, 1917 to February 13, 1918 and discharge estimated from climatological records. †Maximum 11.7 at 4:00 p. m. ‡Minimum 3.62 feet ††Estimated.

Daily discharge, in second-feet, of Clearfield Creek at Dimeling, Clearfield County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	93	93	465	515	1,120	1,340	915	234	565	850	114	111
2	82	123	420	565	675	1,260	1,040	229	790	565	123	103
3	68	99	345	565	515	1,120	850	218	730	420	157	80
4	60	109	294	790	420	1,120	730	297	620	324	157	81
5	63	137	229	1,520	*335	1,040	620	565	515	255	126	68
6	54	121	197	3,580	270	915	1,600	1,260	675	258	103	90
7	46	109	169	1,900	240	850	1,700	1,340	2,000	375	106	92
8	‡42	98	154	1,180	212	1,150	1,800	1,120	3,580	300	161	915
9	46	103	157	1,340	270	1,600	1,520	1,260	1,520	1,120	279	790
10	47	118	194	1,520	240	1,180	1,180	1,180	1,600	1,420	169	420
11	45	116	148	1,900	200	1,260	915	915	2,000	2,000	130	279
12	47	109	142	1,900	176	†5,800	850	790	1,600	1,260	116	218
13	49	103	139	1,800	144	2,440	790	675	1,420	1,520	121	187
14	58	109	152	*1,600	135	1,900	675	565	1,180	1,120	1,420	157
15	54	106	157	1,520	165	1,900	565	565	620	730	915	135
16	54	109	*154	1,420	154	1,260	565	565	675	620	420	126
17	60	88	144	1,260	176	1,260	465	515	515	675	276	118
18	55	81	135	1,180	375	1,420	359	465	367	565	218	109
19	137	81	126	1,150	565	1,120	465	375	300	620	183	104
20	465	75	109	1,120	675	915	465	375	264	465	146	98
21	515	75	126	1,180	790	850	420	367	246	343	123	92
22	375	70	135	3,440	850	915	351	367	207	420	144	90
23	300	84	154	2,680	915	1,180	314	363	183	339	130	87
24	223	291	165	2,000	1,040	3,040	279	465	420	270	187	78
25	176	297	144	1,180	1,120	2,320	267	375	420	240	162	90
26	123	229	135	730	1,150	1,600	291	375	258	223	133	71
27	92	192	187	515	1,260	1,340	303	367	565	240	112	81
28	73	174	1,120	465	1,340	1,340	234	351	465	185	109	71
29	70	288	850	565	-------	1,180	246	515	980	152	99	70
30	75	420	675	565	-------	1,120	229	915	620	135	123	87
31	77	-------	565	1,040	-------	915	-------	620	-------	124	126	-------

NOTES—*Creek frozen December 16 to 28, 1916; January 14 to 22 and February 4 to March 10, 1917, inclusive, and discharge estimated from climatological data. †Maximum=6,750 second-feet. ‡Minimum=42 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	72	1,120	161	78	53	1,600	223	363	1,600	258	142	1,520
2	‡66	980	167	71	53	1,420	218	321	1,120	182	93	620
3	65	675	144	71	53	1,180	212	288	790	140	73	375
4	81	565	161	65	53	1,040	223	258	565	119	63	300
5	98	465	157	65	53	1,040	234	240	515	111	465	258
6	101	420	144	65	48	1,520	194	282	420	103	850	246
7	90	351	137	65	48	1,420	202	229	515	96	252	226
8	82	314	116	65	53	1,120	355	212	515	90	174	183
9	73	294	*78	65	59	980	363	202	420	95	375	144
10	63	258	53	65	78	1,260	420	192	270	84	276	123
11	82	240	53	65	144	1,900	465	187	255	74	246	118
12	101	226	53	65	420	1,520	565	174	294	82	215	218
13	99	212	53	65	1,600	1,520	1,040	187	243	87	212	1,040
14	83	202	48	65	3,720	5,100	1,520	285	202	75	167	790
15	93	187	48	65	3,860	4,440	††2,000	218	192	70	178	420
16	119	178	48	65	2,920	2,320	††2,320	178	169	78	202	314
17	107	152	48	65	1,800	1,700	††2,560	167	207	††78	130	1,340
18	103	154	48	65	1,040	1,180	2,680	148	375	††78	112	1,340
19	420	150	53	59	1,260	730	2,100	144	207	††78	98	790
20	1,340	135	53	59	†7,140	675	1,700	183	154	††78	93	1,120
21	675	137	59	59	4,600	620	1,520	915	144	††78	88	1,040
22	420	140	65	59	1,900	515	1,260	980	465	††78	78	790
23	252	150	78	59	1,180	515	980	1,420	285	††78	86	565
24	915	139	85	59	1,260	465	790	1,120	234	††126	87	465
25	2,560	121	101	53	1,900	375	675	1,040	180	157	82	420
26	2,440	*109	101	53	6,180	351	565	2,680	159	96	72	375
27	2,680	109	93	53	3,860	314	545	1,700	146	78	77	367
28	2,680	109	85	53	2,220	288	420	2,680	152	63	72	300
29	2,100	109	78	53	-------	276	375	1,600	790	‡55	620	246
30	1,800	117	78	53	-------	252	375	2,560	375	75	420	207
31	1,700	-------	78	53	-------	243	-------	2,680	-------	146	321	-------

NOTES—*Gage heights affected by ice November 26 to 30, 1917; December 9, 1917 to February 13, 1918 and discharge estimated from climatological records. ††Estimated. †Maximum 9,220 second-feet observed at 4:00 p. m. ‡Minimum 55 second-feet.

Estimated Monthly Discharge of Clearfield Creek at Dimeling, Clearfield County.
(Drainage area 370 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	515	‡42	120	0.32	0.37
November	420	70	140	0.38	0.42
December			268	0.72	0.83
January	3,580	465	1,380	3.73	4.30
February			555	1.50	1.56
March	†5,800		1,500	4.05	4.67
April	1,800	229	700	1.89	2.11
May	1,340	218	600	1.62	1.87
June	3,580	183	863	2.33	2.60
July	2,000	124	585	1.58	1.82
August	1,420	99	222	0.60	0.69
September	915	68	170	0.46	0.51
The Year	5,800	42	594	1.61	21.75

NOTES—Creek frozen December 16 to 28, 1916; January 14 to 22 and February 4 to March 10, 1917, inclusive, and discharge estimated from climatological data. †Maximum=6,750 second-feet, March 12, 1917. ‡Minimum=42 second-feet, October 8, 1916.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	2,680	63	696	1.88	2.17
November	1,120		284	0.77	0.86
December	167		88	0.24	0.28
January			62	0.17	0.20
February	7,140		1,700	4.59	4.78
March	5,100	243	1,220	3.30	3.80
April	2,680	194	902	2.44	2.72
May	2,680	144	769	2.08	2.40
June	1,600	144	399	1.08	1.20
July	258	55	100	0.27	0.31
August	850	63	207	0.56	0.65
September	1,520	118	542	1.46	1.63
The Year	7,140		572	1.55	2,100

NOTES—Gage heights affected by ice November 26 to 30, 1917; December 9, 1917, to February 13, 1918 and discharge estimated from climatological records. Maximum 9,220 second-feet February 20. Minimum 55 second-feet October 2, 1917 and July 29

SUSQUEHANNA BASIN—STATION NO. 15

MOSHANNON CREEK AT WINBURNE

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge at Winburne, Clearfield County.

Records Available.—Discharge measurements and gage heights from October 3, 1913, to September 5, 1918.

Drainage Area.—150 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the downstream side of the bridge and is read twice daily by Albert Kolasky.

Channel.—The right bank is high; the left is low and subject to overflow at extreme stages, and the bed is composed of gravel.

Discharge Measurement of Moshannon Creek at Winburne, Clearfield County.
(Drainage area 150 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
13	July 28	Bowen	95	0.85	131	0.2 & 0.8 method
14	Nov. 21	Wilson	80	0.76	90	0.6 method
	1918					
15	July 26	Reckord & Shade	77	0.61	74	0.6 method

Daily Mean Gage Heights, in feet, of Moshannon Creek at Winburne, Clearfield County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.50	0.50	0.60	2.00	1.38	1.38	1.46	0.40	0.62	0.90	0.52	0.50
2	0.50	0.50	0.60	1.94	1.28	1.25	1.42	0.40	0.62	0.82	0.50	0.50
3	0.50	0.50	0.60	1.90	1.24	1.14	1.36	0.40	0.55	0.80	0.50	0.50
4	0.50	0.50	0.60	1.84	1.28	1.12	1.30	0.40	0.50	0.76	0.50	0.50
5	0.40	0.58	0.50	2.02	1.10	1.05	1.20	0.36	0.40	0.56	0.40	0.50
6	0.50	0.65	0.60	†2.82	1.20	1.10	1.30	0.54	0.50	0.62	0.50	0.50
7	0.50	0.58	0.60	1.72	1.25	1.10	1.27	0.60	0.60	0.60	0.50	0.50
8	0.50	0.50	0.60	1.48	1.25	1.18	1.25	0.64	1.22	0.56	0.50	0.72
9	0.50	0.50	0.60	1.28	1.25	1.20	1.25	0.65	1.12	0.78	0.50	0.68
10	0.40	0.40	0.50	1.05	1.15	1.42	1.14	0.55	1.86	0.95	0.40	0.58
11	0.50	0.50	0.60	1.26	1.25	1.86	*1.21	0.82	1.98	1.18	0.50	0.52
12	0.50	0.50	0.60	1.30	*1.82	2.09	1.14	1.00	1.80	1.11	0.50	0.50
13	0.50	0.50	0.60	1.38	2.40	2.08	1.10	1.04	1.55	0.92	0.50	0.50
14	0.50	0.50	0.60	1.40	2.40	1.88	1.09	1.00	1.38	0.85	0.62	0.50
15	0.40	0.40	0.50	1.30	2.30	1.62	0.89	0.90	1.15	0.98	0.60	0.50
16	0.50	0.50	*1.10	1.32	2.28	1.62	0.95	0.96	1.12	1.10	0.70	0.50
17	0.50	0.50	1.10	1.26	2.19	1.54	0.99	0.90	1.10	1.05	0.66	0.50
18	0.50	0.50	1.10	1.20	2.15	1.40	0.92	0.85	1.01	0.90	0.58	0.50
19	0.90	0.50	1.10	1.20	2.09	1.37	0.95	0.85	0.96	0.88	0.52	0.50
20	0.80	0.40	1.10	1.04	1.89	1.26	0.85	0.75	0.82	0.72	0.50	0.50
21	0.70	0.50	1.20	1.14	1.94	1.42	0.95	0.85	0.89	0.80	0.50	0.50
22	0.62	0.50	1.20	1.62	1.91	1.39	0.89	0.82	0.78	0.68	0.50	0.50
23	0.50	0.58	1.20	1.54	1.90	1.68	0.84	0.82	0.62	0.58	0.50	0.50
24	0.50	0.62	1.20	1.49	1.90	1.82	0.79	0.79	0.50	0.90	0.50	0.50
25	0.40	0.50	1.10	1.34	1.38	1.86	0.65	0.65	0.40	0.80	0.50	0.50
26	0.50	0.60	1.20	1.36	1.39	1.91	0.74	0.75	0.64	0.90	0.50	0.50
27	0.50	0.60	1.28	1.22	1.52	1.92	0.72	0.72	1.00	0.84	0.56	0.50
28	0.50	0.58	1.28	1.10	1.49	1.89	0.58	0.77	1.00	0.87	0.59	0.50
29	0.50	0.60	1.41	1.21	-------	1.78	‡0.42	0.82	1.00	0.74	0.50	0.50
30	0.40	0.50	1.85	1.02	-------	1.52	0.40	0.79	0.84	0.59	0.52	0.50
31	0.50	-------	2.02	1.22	-------	1.52	-------	0.88	-------	0.62	0.50	-------

NOTES—*Creek frozen December 16, 1916 to January 6, 1917, and February 12 to 26, 1917, inclusive. †Maximum 4.60 feet at 9 p. m. estimated from hydrograph. ‡Minimum 0.38 feet April 29 p. m. to May 4, 1917, inclusive.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	-------	-------	0.72	1.41	1.67	2.46	0.98	1.20	2.06	0.80	0.62	0.96
2	-------	-------	0.70	1.40	1.62	1.98	0.96	1.12	1.78	0.76	0.59	0.78
3	-------	-------	0.69	1.50	1.65	1.82	0.95	1.08	1.62	0.74	0.54	0.68
4	-------	-------	0.68	1.51	1.63	1.66	0.98	1.04	1.34	0.74	0.52	0.66
5	-------	-------	0.70	1.48	1.63	1.60	0.91	1.02	1.39	0.70	1.00	0.65
6	-------	-------	0.68	1.46	1.64	1.57	0.90	1.04	1.30	0.70	1.28	-------
7	-------	-------	0.62	1.50	1.73	1.62	0.87	0.99	1.38	0.64	0.88	-------
8	-------	-------	*0.74	1.64	1.89	1.53	0.89	0.98	1.27	0.68	0.76	-------
9	-------	-------	1.49	1.78	2.21	1.48	1.10	0.90	1.13	0.66	0.77	-------
10	-------	-------	1.49	1.76	2.46	1.84	1.18	0.88	1.14	0.66	0.82	-------
11	-------	-------	1.49	1.72	2.50	1.88	1.16	0.85	1.03	0.64	0.82	-------
12	-------	-------	1.49	1.80	2.85	1.79	1.18	0.88	1.02	0.66	0.72	-------
13	-------	-------	1.49	1.71	4.85	1.73	1.18	0.90	0.98	0.66	0.76	-------
14	-------	-------	-------	1.74	5.52	2.46	1.64	0.99	0.93	0.70	0.72	-------
15	-------	-------	-------	1.86	4.62	3.70	2.36	0.89	0.92	0.64	0.67	-------
16	-------	-------	-------	1.78	4.20	3.13	2.52	0.84	0.89	0.57	0.64	-------
17	-------	-------	-------	1.77	3.78	2.48	2.45	0.82	0.90	0.64	0.59	-------
18	-------	-------	-------	1.75	3.21	2.08	2.34	0.80	0.90	0.59	0.58	-------
19	-------	-------	-------	1.72	3.23	1.85	2.10	0.82	0.82	0.60	0.58	-------
20	-------	-------	1.09	1.70	5.32	1.64	1.82	0.84	0.80	0.58	0.59	-------
21	-------	0.76	1.09	1.68	†7.20	1.49	1.80	1.03	0.77	0.56	0.57	-------
22	-------	0.79	1.20	1.68	6.62	1.44	1.88	1.05	1.23	0.54	0.56	-------
23	-------	0.80	1.26	1.68	5.66	1.35	1.70	1.19	1.04	0.57	0.54	-------
24	-------	0.78	1.40	1.70	4.33	1.26	1.62	1.11	0.80	0.80	0.54	-------
25	-------	0.74	1.50	1.70	2.40	1.23	1.54	1.10	0.84	0.68	‡0.52	-------
26	-------	0.80	1.55	1.70	3.38	1.20	1.40	2.22	0.80	0.62	0.52	-------
27	-------	0.98	1.52	1.70	3.30	1.14	1.34	3.11	0.80	0.57	‡0.52	-------
28	-------	1.01	1.44	1.66	2.92	1.10	1.28	3.04	0.78	0.54	0.54	-------
29	-------	0.81	1.40	1.65	-------	1.08	1.22	2.44	1.03	0.52	0.88	-------
30	-------	0.72	1.38	1.70	-------	1.04	1.20	2.39	1.06	0.66	0.81	-------
31	-------	-------	1.41	1.70	-------	0.98	-------	2.34	-------	0.78	0.65	-------

NOTES—*Gage heights affected by ice December 8, 1917 to February 14, 1918. †Maximum 7.6 feet at 5:00 p. m. ‡Minimum 0.50 feet.

SUSQUEHANNA BASIN—STATION NO. 16

DRIFTWOOD BRANCH SINNEMAHONING CREEK AT STERLING RUN

DESCRIPTION OF STATION

Location.—At three span, steel, through truss, highway bridge about 9 miles above the mouth at Sterling Run, Cameron County.

Records Available.—Discharge measurements and gage heights from September 30, 1913, to September 30, 1917, and discharge measurements October 1, 1917, to September 30, 1918.

Drainage Area.—270 square miles.

Gage.—A standard chain gage, whose elevation of zero is 894.60 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by John E. Whiting.

Channel.—Both banks are low and subject to overflow at extreme stages, and the bed is composed of gravel.

Remarks.—Sterling Run enters the creek about 700 feet below the bridge.

Discharge Measurements of Driftwood Branch Sinnemahoning Creek at Sterling Run, Cameron County.
(Drainage area 270 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
26	Mar. 22	Reckord	315	2.02	777	Surf. & 0.6 method.
27	Mar. 24	Reckord	598	3.36	2,824	Surface method.
28	July 24	Bowen	291	1.93	638	0.6 method.
	1918					
29	July 21	Reckord and Shade	70	0.71	24	Surface method.

Daily Mean Gage Heights, in feet, of Driftwood Branch Sinnemahoning Creek at Sterling Run, Cameron County, for the year ending September 30, 1917.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	0.79	1.23	1.77	1.67	1.59	2.31	2.11	1.27	2.51	1.45	1.13	1.27
2	0.71	1.11	1.61	1.75	1.51	2.03	2.29	1.23	2.43	1.42	1.10	1.29
3	0.69	0.97	1.51	1.68	1.37	1.83	2.36	1.21	2.21	1.42	1.11	1.31
4	0.68	1.06	1.47	1.67	*1.65	1.70	2.27	1.23	1.96	1.31	1.01	1.19
5	0.67	0.99	1.39	2.90	-------	1.56	2.11	1.46	1.81	1.21	0.96	1.16
6	0.65	0.93	1.34	2.74	-------	1.59	2.39	2.02	1.69	1.19	0.96	1.14
7	0.61	0.92	1.29	2.31	-------	1.49	2.35	2.07	2.69	1.13	0.92	1.14
8	‡0.62	0.87	1.27	2.07	1.61	1.47	2.29	2.05	2.96	1.19	0.99	1.19
9	0.65	0.89	1.24	1.97	1.39	1.47	2.20	2.03	2.45	1.41	1.81	1.17
10	0.67	1.04	1.24	1.89	1.35	1.63	2.05	2.09	2.35	1.32	1.29	1.11
11	0.67	1.05	1.17	1.67	1.40	2.03	1.86	2.05	2.45	4.03	1.16	1.05
12	0.65	0.98	1.20	1.51	1.31	3.45	1.75	1.95	2.21	2.65	1.09	1.04
13	0.67	0.95	1.17	1.71	1.41	2.66	1.69	1.83	1.96	2.11	1.07	0.97
14	0.99	1.01	1.13	1.71	1.27	2.45	1.60	1.69	1.76	1.86	4.79	1.00
15	0.85	1.05	1.20	1.69	1.36	2.44	1.53	1.57	1.65	2.03	7.39	0.97
16	0.77	0.97	1.21	1.71	1.50	2.28	1.49	1.46	1.61	1.86	3.41	0.95
17	0.70	0.93	1.15	1.61	1.54	2.76	1.42	1.46	1.41	1.99	2.59	0.92
18	0.71	0.95	1.24	1.75	1.68	2.80	1.37	1.40	1.31	2.16	2.09	0.95
19	0.91	0.89	1.13	1.77	1.74	2.45	1.39	1.41	1.29	2.11	1.82	0.91
20	1.35	0.93	*1.09	1.84	1.71	2.18	1.42	1.45	1.23	1.95	1.63	0.91
21	1.45	0.87	1.19	1.79	1.67	2.10	1.42	1.53	1.17	1.83	1.51	1.01
22	1.23	0.83	1.17	2.11	1.64	2.02	1.45	1.97	1.11	1.79	1.48	0.91
23	1.07	0.90	1.33	2.54	1.74	2.14	1.40	2.22	1.09	1.71	1.37	0.89
24	0.96	1.57	1.31	2.64	2.12	3.31	1.35	2.16	1.36	1.90	1.51	0.86
25	0.93	1.27	1.18	2.29	2.22	3.04	1.31	2.05	1.13	1.65	1.36	0.86
26	0.94	1.33	1.21	1.89	2.07	2.79	1.32	1.81	1.09	1.50	1.23	0.85
27	0.90	1.37	1.30	1.57	3.19	2.76	1.29	1.83	2.25	1.67	1.16	0.85
28	0.87	1.25	1.59	1.84	2.67	2.76	1.25	1.95	1.66	1.53	1.11	0.86
29	0.80	1.51	1.70	1.87	-------	2.55	1.21	2.04	1.63	1.41	1.39	0.91
30	0.84	2.01	1.73	1.61	-------	2.31	1.25	2.70	1.55	1.32	1.37	0.93
31	0.83	-------	1.73	2.04	-------	2.15	-------	2.40	-------	1.20	1.39	-------

NOTES—*Creek frozen December 20, 1916 to January 5, 1917, and February 4 to 27, 1917, inclusive. ‡Minimum 0.59 ft. at 6 p. m.

SUSQUEHANNA BASIN —STATION NO. 17

KETTLE CREEK AT LEIDY

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge at Leidy, Clinton County, 11 miles above the mouth of the creek.

Records Available.—Discharge measurements and gage heights from December 2, 1913, to September 30, 1918.

Drainage Area—202 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge and is read twice daily by J. C. McCoy.

Channel.—The right bank is high and steep; the left is low with gradual slopes but not subject to overflow, and the bed is composed of clean gravel.

Discharge Measurements of Kettle Creek at Leidy, Clinton County.
(Drainage area 202 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
7	Mar. 23	Reckord	375	3.46	679	Surf. & 0.6 method
8	Mar. 26	Reckord	557	4.70	1,905	Surf. & 0.6 method
9	July 22	Bowen	381	3.48	615	0.2. & 0.8 method
	1918					
10	July 22	Reckord & Shade	152	1.79	34	0.6 method

Daily Mean Gage Heights, in feet, of Kettle Creek at Leidy, Clinton County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916–1917												
1	2.06	2.15	2.79	2.61	3.80	8.68	3.60	2.39	3.88	2.42	2.70	2.54
2	1.99	2.07	2.76	2.63	3.63	7.28	3.78	2.34	3.58	2.37	2.60	2.48
3	1.91	2.03	2.73	2.82	3.46	6.08	4.26	2.31	3.30	2.35	2.52	2.44
4	1.86	2.03	2.71	2.84	*3.45	5.68	4.10	2.30	3.27	2.33	2.44	2.47
5	1.82	2.05	2.67	2.96	3.53	5.00	4.00	2.66	3.40	2.31	2.36	2.38
6	1.80	2.03	2.62	3.69	3.63	4.50	4.90	3.43	3.53	2.29	2.28	2.34
7	1.79	2.00	2.59	3.94	3.68	4.04	3.86	3.60	†4.98	2.27	2.26	2.30
8	1.78	1.97	2.46	4.06	3.66	3.68	3.83	3.60	5.43	2.26	2.28	2.25
9	1.77	1.97	2.51	3.93	3.64	3.28	3.78	3.80	4.50	2.86	2.58	2.23
10	1.77	1.96	2.55	3.82	3.62	3.06	3.70	3.90	4.10	2.89	2.37	2.17
11	1.75	1.94	2.49	3.77	3.60	3.56	3.53	3.76	4.06	2.86	2.20	2.13
12	1.72	1.93	2.47	3.74	3.54	4.96	3.22	3.60	3.70	2.96	2.17	2.09
13	‡1.70	1.92	2.47	3.78	3.53	4.42	3.07	3.38	3.38	3.18	2.14	2.06
14	1.91	1.99	2.51	4.03	3.48	4.04	3.00	3.20	3.10	3.13	2.53	2.02
15	1.89	2.04	2.77	3.98	3.53	3.73	2.90	3.10	2.96	3.10	2.48	1.98
16	1.85	2.03	2.62	3.90	3.60	3.40	2.84	2.93	2.88	3.00	2.78	1.96
17	1.83	2.01	*2.67	3.86	3.76	3.73	2.77	2.75	2.76	2.86	2.70	1.93
18	1.82	2.01	2.79	3.88	3.90	4.03	2.71	2.64	2.67	2.82	2.64	1.92
19	2.06	1.98	2.82	3.93	3.87	3.63	2.66	2.60	2.54	2.80	2.53	1.90
20	2.57	1.97	2.72	3.88	3.98	3.56	2.63	2.64	2.46	2.74	2.36	1.87
21	3.15	1.97	2.71	3.90	3.80	3.46	2.61	2.56	2.38	2.68	2.32	1.86
22	2.89	1.97	2.68	4.08	3.76	3.38	2.58	2.67	2.34	3.47	2.28	1.84
23	2.71	2.11	2.67	4.10	3.90	3.49	2.54	3.17	2.29	3.46	2.24	1.83
24	2.55	2.39	2.65	3.98	4.16	4.88	2.52	3.50	2.48	3.33	2.54	1.82
25	2.39	2.39	2.63	3.88	4.20	4.96	2.48	3.64	2.43	3.26	2.41	1.80
26	2.29	2.43	2.52	3.73	4.34	4.72	2.46	3.52	2.38	3.47	2.24	1.80
27	2.21	2.47	2.47	3.68	5.30	4.83	2.43	3.33	2.54	3.23	2.17	1.78
28	2.16	2.46	2.71	3.74	7.98	4.83	2.40	3.40	2.48	2.93	2.13	1.87
29	2.12	2.46	2.69	3.78	------	4.38	2.36	4.13	2.46	2.80	2.30	1.88
30	2.07	2.72	2.65	3.82	------	3.98	2.36	4.32	2.43	3.10	2.30	1.86
31	2.06	------	2.63	3.84	------	3.66	------	4.00	------	2.85	2.53	------

NOTES—*Creek frozen December 17, 1916 to January 6, 1917, and February 4 to March 11, 1917, inclusive. †Maximum 7.30 feet at 10 p.m. estimated from hydrograph. ‡Minimum 1.70 feet.

Daily Mean Gage Heights, in feet, of Kettle Creek at Leidy, Clinton County, for the period of October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917–1918												
1	1.93	4.13	2.34	3.03	3.18	6.12	2.60	2.92	3.44	2.47	1.84	2.40
2	1.91	3.78	2.16	3.12	3.10	5.30	2.58	2.92	3.24	2.36	1.78	2.04
3	1.89	3.50	2.13	3.16	3.11	4.54	2.60	2.95	3.02	2.29	1.76	1.97
4	2.05	3.26	2.28	3.16	3.15	3.98	2.66	2.94	2.84	2.26	†1.76	1.98
5	2.09	3.03	2.10	3.20	3.16	3.79	2.64	2.94	2.72	2.20	2.18	1.96
6	2.03	2.90	2.18	3.24	3.12	3.68	2.63	2.85	2.66	2.16	1.94	2.12
7	1.96	2.80	2.10	3.32	3.16	3.88	2.60	2.78	2.82	2.12	1.82	2.00
8	1.93	2.70	*2.25	3.37	3.26	3.73	2.64	2.78	2.60	2.09	1.84	1.96
9	1.92	2.63	2.25	3.36	3.38	3.60	2.95	2.82	2.50	2.08	1.81	1.95
10	1.91	2.58	2.64	3.40	3.43	4.05	3.06	2.77	2.49	2.08	2.10	1.88
11	1.89	2.52	2.58	3.42	3.48	3.90	3.13	2.84	2.42	2.07	3.13	1.83
12	2.06	2.47	2.58	3.46	3.57	3.74	3.08	2.81	2.62	2.03	2.45	2.50
13	2.33	2.42	2.59	3.50	4.26	3.69	3.02	2.97	2.53	2.04	2.25	4.41
14	2.37	2.38	2.67	3.46	4.47	3.88	3.38	3.24	2.38	2.01	2.38	3.51
15	2.42	2.36	2.73	3.44	4.72	6.51	4.50	3.44	2.34	1.97	2.57	2.99
16	2.40	2.33	2.70	3.47	5.40	4.89	4.50	3.38	2.28	1.94	2.34	2.80
17	2.30	2.29	2.72	3.46	5.22	4.31	4.44	3.24	2.26	1.92	2.21	4.02
18	2.24	2.26	2.69	3.42	5.13	3.88	4.33	3.06	2.20	1.92	2.10	4.33
19	2.87	2.22	2.66	3.38	5.32	3.60	4.08	3.01	2.16	1.90	2.01	3.83
20	5.04	2.17	2.68	3.37	6.68	3.48	3.83	2.94	2.12	1.88	1.98	4.49
21	4.28	2.12	2.68	3.32	5.36	3.50	3.73	3.61	2.23	1.85	1.96	4.46
22	3.78	2.30	2.72	3.29	4.47	3.53	3.66	3.36	4.60	1.81	1.93	3.96
23	3.46	2.27	2.73	3.34	4.06	3.44	3.62	4.46	4.04	1.80	1.91	3.58
24	4.33	2.23	2.67	3.35	3.62	3.36	3.50	4.15	3.68	1.86	1.88	3.30
25	5.18	2.18	2.81	3.32	3.46	3.13	3.34	3.78	3.36	1.92	1.86	3.16
26	4.86	2.20	2.80	3.38	5.75	3.06	3.18	3.41	3.11	1.94	1.84	3.16
27	4.75	2.26	2.82	3.28	4.90	2.98	3.06	3.28	2.90	1.84	1.82	3.06
28	4.62	2.33	2.90	3.22	4.23	2.84	2.97	4.20	2.75	1.80	1.82	2.98
29	4.68	2.46	2.97	3.32	-------	2.76	2.90	3.58	2.64	1.78	1.95	2.87
30	4.76	2.49	2.90	3.26	-------	2.68	2.97	3.90	2.56	1.88	1.95	2.76
31	4.66	-------	2.92	3.18	-------	2.64	-------	3.66	-------	1.94	2.03	-------

NOTES—*Gage heights affected by ice December 8, 1917 to February 20, 1918. †Maximum 8.8 feet at 8:00 p. m. ‡Minimum 1.73 feet.

SUSQUEHANNA BASIN—STATION NO. 18

WEST BRANCH SUSQUEHANNA RIVER AT RENOVO

DESCRIPTION OF STATION

Location.—At three span, steel, through truss, highway bridge at Eighth Street, Renovo, Clinton County.

Records Available.—Discharge complete from January 1, 1908, to September 30, 1915, and discharge measurements and gage heights from October 1, 1915, to September 30, 1918. For other records on this river see West Branch Susquehanna river at Bower, Clearfield, Williamsport and Lewisburg; also West Branch Susquehanna River at Allenwood in the 1910-11 Report of the Water Supply Commission.

Drainage Area.—2,990 square miles.

Gage.—A standard chain gage, whose elevation of zero is 634.03 feet above mean sea level, is located on the upstream side of the bridge and is read twice daily by F. H. Walize.

Channel.—Both banks are high and not subject to overflow, and the bed is composed of rock.

Discharge Measurements of West Branch Susquehanna River at Renovo, Clinton County.
(Drainage area 2,990 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
30	Mar. 20	Reckord	3,247	4.10	9,693	Surface method
31	Mar. 25	Reckord	4,648	7.27	24,120	Surface method
32	May 24	Wilson	2,734	2.74	5,186	0.2 & 0.8 method
33	July 23	Bowen	2,557	2.28	3,838	0.2 & 0.8 method
34	Dec. 17	Wilson	1,661	1.00	726	Under ice cover
	1918					
35	Jan. 14	Wilson	1,567	1.07	916	Under ice cover
36	July 20	Reckord & Shade	1,548	−0.10	504	0.6 method

Daily Mean Gage Heights, in feet, of West Branch Susquehanna River at Renovo, Clinton County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916–1917												
1	0.2	0.1	2.5	1.9	*3.2	6.5	3.9	1.3	4.0	2.7	1.1	1.0
2	0.1	0.4	2.3	1.7	4.4	4.9	3.9	1.3	3.8	2.2	1.0	0.9
3	−0.04	0.4	1.9	1.6	7.6	4.0	4.6	1.2	3.5	2.1	0.8	0.8
4	−0.12	0.3	1.7	1.6	7.0	3.2	4.4	1.2	3.2	2.0	0.7	0.6
5	−0.23	0.3	1.5	2.3	7.0	*5.4	3.9	1.4	2.9	1.6	0.6	0.5
6	−0.31	0.3	1.4	5.4	6.7	9.1	4.5	3.3	2.9	1.4	0.6	0.4
7	−0.36	0.3	1.3	5.4	6.8	10.5	5.2	3.9	4.8	1.3	0.4	0.4
8	−0.40	0.3	1.2	4.5	6.9	10.3	5.0	3.9	7.6	1.3	0.6	0.6
9	−0.43	0.2	1.1	3.9	7.0	10.1	4.8	4.0	6.3	1.7	1.2	2.4
10	‡−0.48	0.2	1.1	3.6	6.2	4.5	4.3	4.1	5.2	2.2	1.3	2.3
11	−0.44	0.3	1.0	3.3	5.9	3.0	3.9	3.9	5.6	4.7	1.1	1.5
12	‡−0.49	0.4	1.1	2.7	5.1	†8.1	3.5	3.6	4.9	4.0	0.7	1.1
13	−0.44	0.4	1.0	*2.9	4.8	7.7	3.2	3.2	4.1	3.5	0.5	0.8
14	−0.40	0.4	1.0	2.6	4.4	6.2	3.0	2.8	3.6	3.3	2.0	0.7
15	−0.15	0.3	0.7	2.1	4.6	4.8	2.7	2.6	3.1	3.5	6.0	0.5
16	−0.10	0.4	0.5	1.8	4.8	4.6	2.5	2.3	2.7	3.1	4.6	0.4
17	−0.15	0.3	*0.6	1.5	4.5	4.6	2.2	2.1	2.4	•2.7	3.4	0.3
18	−0.21	0.3	0.9	5.2	4.5	5.6	2.0	1.9	2.1	2.8	2.5	0.2
19	−0.06	0.2	1.1	5.9	5.0	5.0	2.0	1.8	1.9	3.0	2.0	0.2
20	0.8	0.2	1.2	5.7	5.2	4.2	2.0	1.7	1.7	2.7	1.8	0.2
21	1.9	0.2	1.4	5.6	5.1	4.0	2.1	1.7	1.5	2.3	1.3	0.1
22	1.9	0.2	1.5	5.7	5.2	3.9	2.0	1.8	1.3	2.4	1.1	0.1
23	1.5	0.1	1.5	5.7	5.0	4.1	1.9	2.5	1.1	2.3	1.0	0.0
24	1.0	0.2	1.4	4.4	5.0	6.1	1.7	2.7	1.4	2.4	1.0	−0.02
25	0.8	1.2	1.4	3.6	6.4	7.2	1.6	2.8	1.5	2.0	1.0	−0.08
26	0.5	1.3	1.4	2.8	7.1	6.2	1.6	2.5	1.4	1.7	1.0	−0.13
27	0.4	1.2	1.3	2.4	8.5	5.8	1.6	2.4	2.6	2.8	0.8	−0.16
28	0.3	1.1	1.5	2.1	7.3	5.9	1.5	2.4	3.1	2.3	0.6	−0.18
29	0.3	1.2	5.3	2.7	-------	5.3	1.4	3.4	2.9	1.8	0.5	−0.18
30	0.2	1.9	2.8	2.4	-------	4.8	1.3	3.1	3.0	1.6	0.8	−0.14
31	0.2	-------	2.3	2.4	-------	4.3	-------	4.0	-------	1.4	0.9	-------

NOTES—*River frozen December 17 to 29, 1916; January 13 to 23; February 1 to 27 and March 5 to 9, 1917, inclusive. †Maximum 8.6 feet at 3 p.m. estimated from hydrograph. ‡Minimum −0.50 feet.

Daily Mean Gage Heights, in feet, of West Branch Susquehanna River at Renovo, Clinton County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917–1918												
1	-0.12	5.0	1.0	1.7	1.5	8.0	1.7	2.3	5.1	2.4	0.1	1.8
2	-0.10	4.3	0.8	1.6	1.4	7.5	1.5	2.2	4.1	1.8	-0.02	3.0
3	-0.12	3.8	0.5	1.5	1.4	6.1	1.6	2.1	3.6	1.5	-0.06	1.0
4	0.0	3.2	0.6	1.4	1.4	5.1	1.7	2.0	2.9	1.2	-0.02	1.0
5	0.8	2.9	0.7	1.5	1.5	4.6	1.8	2.0	2.7	1.0	-0.08	0.9
6	0.6	2.6	0.6	1.5	1.4	4.4	1.7	1.9	2.7	0.9	0.6	0.8
7	0.5	2.4	0.6	1.4	1.4	4.8	1.6	1.9	3.0	0.7	1.2	1.0
8	0.4	2.2	0.7	1.3	1.5	4.7	1.6	1.8	3.5	0.6	0.7	0.8
9	0.3	1.9	0.7	1.4	1.5	4.9	2.2	1.9	2.9	0.5	0.4	0.6
10	0.2	1.8	0.3	1.6	1.6	5.3	3.0	1.9	2.6	0.4	1.0	0.4
11	0.1	1.7	0.9	1.6	1.8	5.2	3.2	1.8	2.3	0.4	1.7	0.2
12	0.2	1.5	1.1	1.5	2.4	4.9	3.0	1.7	2.6	0.3	1.3	0.4
13	1.0	1.5	1.0	1.5	6.7	4.6	2.9	1.9	2.1	0.3	1.2	2.5
14	0.9	1.2	0.9	1.6	6.5	10.0	3.6	2.8	2.3	0.3	1.4	3.7
15	0.8	1.3	1.0	1.7	6.7	12.0	6.4	3.2	2.0	0.2	1.3	3.0
16	0.9	1.1	1.1	1.7	6.5	8.3	6.8	2.9	1.9	0.1	1.0	2.4
17	0.9	1.1	1.0	1.6	5.4	6.4	6.4	2.6	1.5	0.1	0.7	2.6
18	0.9	1.0	0.9	1.6	4.2	5.2	6.1	2.3	1.5	0.0	0.5	3.8
19	1.5	1.0	1.0	1.6	3.7	4.5	5.7	2.0	1.4	-0.04	0.3	3.7
20	6.1	0.8	0.9	1.0	†13.2	4.0	4.9	2.1	1.2	-0.13	0.1	3.8
21	5.6	0.9	1.0	1.6	10.7	3.8	4.4	3.0	1.1	-0.12	0.0	5.1
22	4.2	0.8	1.1	1.6	7.4	3.6	4.3	3.3	4.0	-0.22	-0.02	4.2
23	3.5	0.9	1.2	1.5	5.6	3.3	4.1	4.1	5.4	-0.22	-0.16	3.4
24	4.7	0.9	1.2	1.4	4.8	3.1	3.8	4.6	4.7	‡-0.28	-0.24	2.6
25	7.6	0.8	1.5	1.5	4.6	2.9	3.5	3.9	2.9	0.2	-0.28	2.4
26	7.1	0.6	1.7	1.6	9.3	2.7	3.2	5.3	2.3	0.3	-0.30	2.4
27	6.6	*0.7	1.9	1.5	8.9	2.5	2.9	6.1	2.0	0.2	-0.30	2.2
28	7.2	0.7	2.2	1.5	6.7	2.2	2.8	5.2	2.0	0.1	-0.30	2.0
29	7.0	0.7	2.3	1.4	-------	2.0	2.5	5.0	1.9	0.0	-0.22	2.0
30	6.4	1.0	2.0	1.4	-------	1.9	2.4	5.4	3.1	-0.06	0.0	1.7
31	5.8	-------	1.8	1.5	-------	1.8	-------	5.9	-------	0.2	1.0	-------

NOTES—*Gage heights affected by ice November 27, 1917 to February 13, 1918. †Maximum 14.5 feet at 5:30 p. m. ‡Minimum -0.32 feet.

SUSQUEHANNA BASIN—STATION NO. 19

BALD EAGLE CREEK AT MILESBURG

DESCRIPTION OF STATION

Location.—At Pennsylvania Railroad Bridge No. 53, over Bald Eagle Creek, 300 yards above the mouth of Spring Creek, at Milesburg, Centre County.

Records Available.—Discharge complete from February 6, 1911, to September 30, 1918. For other records on this creek see Bald Eagle Creek at Beech Creek Station.

Drainage Area.—140 square miles.

Gage.—A 10 foot staff gage, whose elevation of zero is arbitrary, is fastened to the downstream side of the pier and is read twice daily by P. H. Haupt.

Channel.—The right bank is high, steep and rocky, while the left bank is low, although the railroad embankment prevents floods from going around the bridge. The bed is composed of gravel and stones.

Discharge Measurements of Bald Eagle Creek at Milesburg, Centre County.
(Drainage area 140 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
17	Mar. 20	McDowell,	263	1.72	352	Surf. & 0.6 method
18	Mar. 27	Reckord,	278	2.07	396	0.6 method
19	April 19	Knight	172	0.83	77	0.2 & 0.8 method
20	July 19	Bowen,	221	1.35	154	0.2 & 0.8 method
21	Oct. 9	Boehringer,	12	0.02	8	Wading 1,500 ft. above bridge.
	1918					
22	Mar. 25	Penna. State College students.	186	0.95	99	
23	July 18	Reckord & Shade,	17	0.03	8	Wading 500 ft. above bridge.

Daily Mean Gage Heights, in feet, of Bald Eagle Creek at Milesburg, Centre County, for the period October 1, 1916 to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.02	0.12	0.80	-------	-------	1.9	1.48	0.95	1.18	0.55	0.45	0.22
2	0.85	0.06	0.64	-------	-------	1.6	1.5	0.82	1.08	0.64	0.44	0.12
3	0.65	0.05	0.58	-------	-------	1.48	1.6	0.72	1.22	0.58	0.38	0.05
4	0.45	0.05	0.56	-------	-------	1.38	1.41	0.65	1.08	0.48	0.30	0.00
5	0.25	0.18	0.52	-------	-------	1.30	1.5	1.32	1.02	0.42	0.24	0.00
6	0.08	0.14	0.50	2.8	-------	1.22	2.3	1.7	1.08	0.33	0.20	0.00
7	0.05	0.08	0.50	2.3	-------	1.32	2.4	1.7	2.7	0.35	0.20	0.00
8	0.05	0.05	0.50	1.9	-------	1.5	2.1	1.6	2.3	0.32	0.16	1.38
9	0.05	0.05	0.70	1.7	-------	1.6	1.8	1.5	1.8	1.35	0.40	0.74
10	0.05	0.05	0.82	1.7	-------	2.0	1.7	1.42	1.9	1.32	0.32	0.49
11	0.05	0.05	*	1.6	-------	†2.9	1.41	1.32	2.3	2.8	0.30	0.35
12	0.05	0.05	-------	1.5	-------	4.0	1.25	1.24	1.8	1.7	0.25	0.28
13	0.05	0.05	-------	*	-------	2.6	1.12	1.18	1.45	1.46	0.50	0.18
14	0.05	0.05	-------	-------	-------	2.6	1.06	1.05	1.31	1.26	1.6	0.15
15	0.05	0.05	-------	-------	-------	2.4	1.02	0.92	1.55	1.12	1.00	0.15
16	0.05	0.05	-------	-------	-------	2.2	0.92	0.85	1.05	0.95	0.80	0.15
17	0.05	0.05	-------	-------	-------	3.1	0.84	0.82	0.92	0.82	0.62	0.10
18	0.05	0.05	-------	-------	-------	2.2	0.80	0.80	0.88	0.86	0.51	0.04
19	1.38	0.05	-------	-------	-------	2.0	0.80	0.72	0.84	1.42	0.42	0.00
20	1.9	0.05	-------	-------	-------	1.7	1.20	0.68	0.78	1.08	0.35	0.00
21	2.0	0.05	-------	-------	-------	1.6	0.98	0.64	0.68	0.85	0.28	0.00
22	1.5	0.05	-------	-------	-------	1.8	0.88	0.60	0.60	0.65	0.18	0.00
23	1.18	0.08	-------	-------	-------	2.3	0.84	1.15	0.52	0.81	0.15	0.00
24	0.90	0.08	-------	-------	-------	3.1	0.80	0.92	0.72	0.66	0.10	–0.08
25	0.74	0.06	-------	-------	-------	2.5	0.76	0.82	0.62	0.52	0.10	–0.08
26	0.62	0.05	-------	-------	-------	2.2	0.84	0.74	0.58	1.25	0.10	–0.08
27	0.52	0.05	-------	-------	3.2	2.1	0.80	0.68	0.88	1.48	0.10	–0.08
28	0.42	0.58	-------	-------	2.5	2.1	0.76	0.80	0.65	0.91	0.10	–0.08
29	0.32	1.14	-------	-------	-------	2.0	0.72	1.25	0.91	0.71	0.15	–0.08
30	0.22	1.12	-------	-------	-------	1.7	0.62	1.25	0.72	0.58	0.39	‡–0.10
31	0.15	-------	-------	-------	-------	1.5	-------	1.08	-------	0.48	0.32	-------

NOTES—*Creek frozen December 11, 1916 to January 5, 1917, and January 13 to February 26, 1917, inclusive. †Maximum estimated 4.7 feet at 8:00 p. m. ‡Minimum—0.10 feet.

Daily Mean Gage Heights, in feet, of Bald Eagle Creek at Milesburg, Centre County, for the period October 1, 1916 to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	-0.08	1.26	0.35	1.20	1.20	2.4	0.63	1.05	2.0	0.35	0.10	1.28
2	-0.08	1.10	0.35	1.20	1.20	2.3	0.62	0.92	1.5	0.25	0.05	0.84
3	-0.08	0.98	0.35	1.20	1.20	2.1	0.62	0.82	1.25	0.16	0.05	0.50
4	0.12	0.88	0.35	1.20	1.20	2.0	0.68	0.72	1.05	0.14	0.05	0.42
5	0.24	0.84	0.35	1.20	1.20	2.0	0.58	0.90	1.08	0.10	0.70	0.62
6	0.18	0.78	0.35	1.20	1.20	2.1	0.53	0.91	1.02	0.10	0.55	1.02
7	0.08	0.72	0.35	1.20	1.20	2.3	0.50	0.78	0.95	0.10	0.35	0.75
8	0.03	0.66	0.35	1.20	1.20	1.9	1.10	0.72	0.85	0.10	0.25	0.58
9	0.01	0.62	0.35	1.20	1.20	1.8	2.0	0.70	0.66	0.10	0.10	0.48
10	-0.04	0.56	0.35	1.20	1.20	2.7	1.8	0.67	0.58	0.10	0.40	0.42
11	-0.06	0.54	0.35	1.20	1.42	2.1	1.8	0.65	0.65	0.10	0.40	0.38
12	‡-0.10	0.50	0.35	1.20	2.4	2.0	1.8	0.64	0.85	0.10	0.12	1.18
13	-0.02	0.46	0.35	1.20	5.6	1.9	2.0	1.28	0.68	0.10	0.10	2.8
14	0.05	0.43	0.35	1.20	3.8	5.0	3.7	1.5	0.58	0.22	0.15	1.14
15	0.05	0.40	0.35	1.20	3.4	3.5	3.9	1.26	0.48	0.18	0.18	0.79
16	0.02	0.40	0.35	1.20	3.2	2.4	3.2	1.10	0.42	0.10	0.10	0.78
17	0.10	0.40	0.35	1.20	2.8	2.0	2.2	0.98	0.40	0.08	0.08	1.6
18	0.06	0.37	0.36	1.20	2.5	1.8	3.0	0.88	0.36	0.04	0.00	1.8
19	0.40	0.37	0.49	1.20	2.6	1.6	1.8	0.85	0.32	0.00	0.00	1.6
20	1.18	0.36	0.64	1.20	6.1	1.39	1.7	0.84	0.25	0.00	-0.02	3.0
21	0.78	0.34	0.76	1.20	3.4	1.24	2.3	0.90	0.20	0.00	-0.05	2.0
22	0.55	0.42	0.82	1.20	2.5	1.16	2.4	0.96	1.5	0.00	0.05	1.5
23	0.48	0.44	0.85	1.20	2.2	1.12	2.1	1.9	1.05	‡-0.08	0.35	1.25
24	2.6	0.40	0.92	1.20	2.2	1.08	1.8	1.32	0.62	‡-0.05	0.15	1.05
25	3.3	*0.40	1.02	1.20	3.2	1.00	1.6	1.5	0.52	0.35	0.10	0.92
26	2.1	0.40	1.12	1.20	†6.7	0.92	1.38	5.7	0.44	0.15	0.10	1.00
27	1.7	0.40	1.18	1.20	3.1	0.85	1.21	2.3	0.40	0.05	0.10	0.82
28	1.8	0.40	1.20	1.20	2.6	0.76	1.06	3.2	0.36	0.00	0.10	0.72
29	1.5	0.40	1.20	1.20	-------	0.72	1.00	2.2	0.50	0.05	3.0	0.62
30	1.9	0.40	1.20	1.20	-------	0.66	1.12	3.4	0.46	0.42	0.94	0.52
31	1.5	-------	1.20	1.20	-------	0.65	-------	2.8	-------	0.20	1.19	-------

NOTES—*Gage heights affected by ice November 25, 1917 to February 13, 1918. †Maximum 8.3 feet at 6.00 a. m. ‡Minimum -0.10 feet.

Daily discharge, in second-feet, of Bald Eagle Creek at Milesburg, Centre County, for the period October 1, 1916 to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	91	6	62	15	195	335	190	82	121	35	26	11
2	68	4	44	15	170	225	195	65	102	44	25	6
3	45	4	38	22	145	190	225	52	129	38	21	4
4	26	4	36	40	125	165	172	45	102	28	15	3
5	12	9	32	195	105	145	195	150	91	24	12	3
6	4	7	30	840	105	129	525	260	102	21	10	3
7	4	4	30	525	88	150	580	260	770	19	10	3
8	4	4	30	335	88	195	420	225	525	16	8	165
9	4	4	50	260	75	225	295	195	295	158	22	55
10	4	4	65	260	75	375	260	175	335	150	16	29
11	4	4	*40	225	75	†920	172	150	525	840	15	18
12	4	4	22	195	75	2,280	135	133	295	260	12	14
13	4	4	15	*145	75	700	109	121	183	185	30	9
14	4	4	15	125	75	700	98	96	148	137	225	7
15	4	4	15	88	75	580	91	78	115	109	88	7
16	4	4	15	75	75	470	78	69	96	82	62	7
17	4	4	15	62	75	1,110	67	65	78	65	42	5
18	4	4	15	62	225	470	62	62	72	70	31	4
19	165	4	15	62	170	375	62	52	67	175	24	3
20	335	4	15	62	145	260	125	48	60	102	18	3
21	375	4	15	62	145	225	85	44	48	69	14	3
22	195	4	15	105	195	295	72	40	40	45	9	3
23	121	4	15	170	295	525	67	115	32	63	7	3
24	75	4	15	195	420	1,110	62	78	52	46	5	2
25	55	4	15	225	640	640	57	65	42	32	5	2
26	42	4	15	260	920	470	67	55	38	135	5	2
27	32	4	15	260	1,220	420	62	48	72	190	5	2
28	24	38	22	225	640	420	57	62	45	76	5	2
29	16	113	30	225	-------	375	52	135	76	51	7	2
30	11	109	22	225	-------	260	42	135	52	38	21	‡2
31	8	-------	22	195	-------	195	-------	102	-------	28	16	-------

NOTES—*Creek frozen December 11, 1916 to January 5, 1917, and January 13 to February 26, 1917, inclusive, and discharge estimated from climatological data. †Maximum=3,390 second-feet. ‡Minimum=2 second-feet.

Daily discharge, in second-feet, of Bald Eagle Creek at Milesburg, Centre County, for the period October 1, 1916 to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	5	143	28	41	28	580	54	108	375	28	11	146
2	5	116	28	41	28	525	53	90	195	20	9	41
3	5	98	28	41	28	420	53	77	141	15	9	41
4	12	84	24	36	28	375	60	64	108	13	9	34
5	20	79	24	36	28	375	49	87	113	11	62	53
6	16	72	24	36	28	420	44	88	104	11	46	104
7	10	64	24	36	28	525	41	72	94	11	28	68
8	8	58	24	36	28	330	116	64	80	11	20	49
9	7	53	24	36	32	290	375	62	58	11	11	39
10	6	47	24	36	36	770	290	59	49	11	32	34
11	5	45	24	32	56	420	290	56	56	11	32	30
12	†4	41	24	32	108	375	290	55	80	11	12	129
13	6	37	24	32	1,920	330	375	146	60	11	11	840
14	9	35	24	32	1,990	3,900	1,850	195	49	18	14	122
15	9	32	24	32	1,460	1,590	2,130	143	39	16	16	73
16	8	32	24	32	1,220	580	1,220	116	34	11	11	72
17	11	32	24	32	840	375	470	98	32	10	10	225
18	9	30	24	32	640	290	1,019	84	29	9	7	290
19	32	20	24	32	700	225	290	80	26	7	7	225
20	129	29	28	32	‡5,900	168	255	79	20	7	6	1,010
21	72	27	32	32	1,460	139	525	87	17	7	6	375
22	46	34	41	32	640	126	580	95	195	7	9	195
23	39	36	41	32	470	119	420	330	108	‡5	28	141
24	700	32	46	32	470	113	290	154	53	‡6	14	108
25	1,340	*28	51	32	†1,220	101	225	195	43	28	11	90
26	420	28	51	32	†††7,120	90	166	††5,120	36	14	11	101
27	255	28	46	28	1,110	80	134	525	32	9	11	77
28	290	28	41	28	700	69	110	1,220	29	7	11	64
29	195	28	41	28	-------	64	101	470	41	9	1,010	53
30	330	28	41	28	-------	58	119	1,460	37	34	93	43
31	195	-------	41	28	-------	56	-------	840	-------	17	310	-------

NOTES—*Gage heights affected by ice November 25, 1917 to February 13, 1918 and discharge estimated from climatological records. ††Estimated. †Maximum ††10,400 second-feet from hydrograph at 6:00 a. m. ‡Minimum 4 second-feet.

Estimated Monthly Discharge of Bald Eagle Creek at Milesburg, Centre County.
(Drainage area 140 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	375	4	56	0.40	0.46
November	113	4	13	0.09	0.10
December	65	15	26	0.19	0.22
January	840	-------	186	1.33	1.53
February	1,220	-------	240	1.71	1.78
March	‡2,280	129	482	3.44	3.97
April	580	42	156	1.11	1.24
May	260	40	105	0.75	0.86
June	525	32	157	1.12	1.25
July	840	16	107	0.76	0.88
August	225	5	26	0.19	0.22
September	165	‡2	13	0.09	0.10
The year	2,280	2	130	0.93	12.61

NOTES—Creek frozen December 11, 1916 to January 5, 1917, and January 13 to February 26, 1917, inclusive, and discharge estimated from climatological data. †Maximum=3,390 second-feet, March 11, 1917. ‡Minimum=2 second-feet, September 30, 1917.

Estimated Monthly Discharge of Bald Eagle Creek at Milesburg, Centre County.
(Drainage area 140 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	1,340	4	135	0.96	1.11
November	143	27	48	0.34	0.38
December			31	0.22	0.25
January			33	0.24	0.28
February	††7,120		1,010	7.21	7.51
March	3,900	56	448	3.20	3.69
April	2,130	41	400	2.86	3.19
May	††5,120	55	397	2.84	3.27
June	375	17	78	0.56	0.62
July	34	5	13	0.09	0.10
August	1,010	6	55	0.39	0.45
September	1,010	30	164	1.17	1.31
The year	††7,120	4	229	1.64	22.16

NOTES—Gage heights affected by ice November 25, 1917, to February 13, 1918, and discharge estimated from climatological records. Maximum ††10,400 second-feet February 26. Minimum 4 second-feet October 12, 1917, July 23 and 24, 1918. ††Estimated.

SUSQUEHANNA BASIN—STATION NO. 20

SPRING CREEK NEAR BELLEFONTE

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge one mile below Bellefonte, Centre County.

Records Available.—Discharge complete from February 7, 1911, to September 11, 1915, and discharge measurements and gage heights from September 12, 1915, to September 30, 1918.

Drainage Area.—145 square miles.

Gage.—A staff gage, whose elevation of zero is 714.25 feet above mean sea level, is located on the downstream side of the left abutment and is read twice daily by J. H. Oliger.

Channel.—Both banks are flat and overflow during extreme stages, and the bed is composed of gravel and stone.

Remarks.—There is a canal about 300 feet east of the creek proper which carries a small part of the flow of the stream, most of which is leakage through the head gates.

Discharge Measurements of Spring Creek near Bellefonte, Centre County.
(Drainage area 145 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec. ft.	
15	Mar. 19	McDowell	185	2.25	447	Surf. & 0.6 method Creek proper
	Mar. 19	McDowell	29	1.40	25	Surface method Canal
16	Mar. 27	Reckord	200	2.24	301	0.6 method Creek proper
17	April 29	Knight	161	1.84	179	0.2 & 0.8 method Creek proper
	April 29	Knight	33	1.30	25	0.6 method canal
18	May 25	Wilson	147	1.75	151	0.2 & 0.8 method Creek proper
	May 25	Wilson	27	1.30	16	0.6 method canal
19	July 19	Bowen	139	1.68	134	0.6 method creek proper
	July 19	Bowen	36	1.55	14	0.6 method canal
	1918					
20	July 18	Reckord & Shade	109	1.68	121	0.6 method canal

Daily Mean Gage Heights, in feet, of Spring Creek near Bellefonte, Centre County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.68	1.62	1.78	1.60	1.95	2.08	2.05	1.76	1.75	1.70	1.65	1.60
2	1.68	1.78	1.78	1.60	1.86	2.09	2.05	1.80	1.75	1.78	1.65	1.58
3	1.65	1.68	1.75	1.58	1.65	2.02	2.06	1.76	1.75	1.75	1.68	1.55
4	1.62	1.61	1.68	1.61	1.82	1.90	2.02	1.76	1.78	1.75	1.65	1.55
5	1.76	1.58	1.68	1.60	1.70	1.85	1.98	1.80	1.78	1.71	1.62	1.53
6	1.72	1.62	1.65	1.92	1.70	1.78	2.28	1.80	1.75	1.68	1.65	1.58
7	1.62	1.65	1.61	1.80	1.76	1.80	2.27	1.81	1.98	1.65	1.64	1.61
8	1.62	1.68	1.60	1.78	1.70	1.85	2.18	1.86	1.94	1.68	1.62	1.76
9	1.62	1.75	1.61	1.76	1.70	1.88	2.20	1.88	1.90	1.75	1.64	1.62
10	1.65	1.71	1.58	1.71	1.68	1.88	2.12	1.88	2.04	1.71	1.61	1.60
11	1.60	1.60	1.58	1.70	1.67	2.70	2.09	1.82	2.05	1.80	1.60	1.58
12	1.60	1.58	1.58	1.70	1.68	2.85	2.05	1.78	1.90	1.78	1.60	1.58
13	1.60	1.58	1.58	1.68	1.62	2.50	2.00	1.82	1.94	1.80	1.70	1.58
14	1.64	1.81	1.58	1.68	1.70	2.42	2.00	1.80	2.05	1.78	1.98	1.58
15	1.60	1.60	1.58	1.68	1.68	2.38	1.96	1.80	1.90	1.80	1.85	1.58
16	1.60	1.56	1.58	1.66	1.68	2.20	1.90	1.80	1.88	1.78	1.65	1.56
17	1.65	‡1.51	1.58	1.64	1.74	2.32	1.90	1.78	1.81	1.74	1.65	1.55
18	1.68	1.54	1.58	1.66	2.65	2.42	1.88	1.78	1.80	1.78	1.65	1.55
19	1.70	1.57	1.58	1.62	2.02	2.30	1.86	1.78	1.78	1.78	1.65	1.55
20	1.70	1.58	1.58	1.72	1.78	2.20	1.90	1.76	1.76	1.81	1.65	1.55
21	1.72	1.56	1.58	1.65	1.98	2.15	1.85	1.75	1.75	1.68	1.61	1.55
22	1.65	1.58	1.54	1.78	1.88	2.20	1.82	1.78	1.75	1.66	1.60	1.55
23	1.71	1.56	1.52	1.82	1.75	2.40	1.82	1.80	1.75	1.70	1.60	1.55
24	1.68	1.64	1.54	1.78	†3.58	2.30	1.80	1.78	1.78	1.68	1.59	1.55
25	1.65	1.61	1.58	1.71	2.08	2.30	1.80	1.76	1.75	1.68	1.58	1.55
26	1.64	1.55	1.61	1.70	2.74	2.29	1.80	1.75	1.75	1.75	1.56	1.58
27	1.60	1.72	1.64	1.68	2.25	2.26	1.80	1.75	1.81	1.75	1.56	1.58
28	1.60	1.70	1.74	1.68	2.14	2.21	1.78	1.78	1.78	1.65	1.58	1.55
29	1.60	1.60	1.60	1.75	-------	2.20	1.78	1.80	1.80	1.66	1.58	1.55
30	1.60	1.65	1.58	1.82	-------	2.16	1.78	1.75	1.78	1.65	1.60	‡1.51
31	1.61	-------	1.56	1.90	-------	2.10	-------	1.78	-------	1.65	1.60	-------

NOTES—†Maximum 4.20 feet at 10 a. m. estimated from hydrograph. ‡Minimum 1.50 feet at 5 p. m. November 17, 1916, and September 30, 1917.

Daily Mean Gage Heights, in feet, of Spring Creek near Bellefonte, Centre County, for the period October 1, 1916 to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.50	1.90	1.58	1.55	1.48	2.61	2.00	2.14	2.24	1.80	1.76	1.76
2	1.50	1.84	1.58	1.59	1.42	2.50	1.95	2.10	2.08	1.78	1.68	1.65
3	1.52	1.75	1.60	1.55	1.41	2.42	1.90	2.08	2.04	1.71	1.66	1.68
4	1.52	1.71	1.58	1.49	1.44	2.36	1.89	2.05	2.00	1.70	1.64	1.74
5	1.54	1.70	1.55	1.52	‡1.38	2.34	1.85	2.06	1.98	1.69	2.18	1.70
6	1.54	1.70	1.55	1.52	1.45	2.35	1.85	2.08	1.98	1.69	1.76	1.73
7	1.55	1.70	1.52	1.50	1.48	2.41	1.85	2.00	2.00	1.69	1.78	1.65
8	1.54	1.70	1.51	1.52	1.54	2.34	1.85	1.96	1.90	1.70	1.70	1.62
9	1.52	1.69	1.50	1.51	1.50	2.29	1.80	1.93	1.92	1.70	1.71	1.68
10	1.50	1.65	1.52	1.50	1.50	2.55	1.95	1.93	1.88	1.70	1.94	1.68
11	1.50	1.65	1.55	1.50	1.56	2.30	2.08	1.90	1.89	1.68	1.72	1.70
12	1.50	1.68	1.55	1.50	1.61	2.25	2.00	1.90	1.89	1.68	1.80	1.65
13	1.50	1.68	1.55	1.49	3.35	2.25	2.08	2.06	1.85	1.67	1.82	1.80
14	1.48	1.66	1.55	1.50	2.38	3.12	2.20	2.05	1.89	1.65	1.78	1.65
15	1.50	1.69	1.55	1.50	2.80	2.95	2.85	1.98	1.80	1.65	1.72	1.62
16	1.50	1.65	1.55	1.50	2.35	2.75	3.15	1.95	1.78	1.64	1.70	1.65
17	1.50	1.62	1.55	1.50	2.20	2.60	3.11	1.98	1.86	1.68	1.68	1.84
18	1.50	1.61	1.52	1.49	2.08	2.46	3.15	1.98	1.81	1.67	1.64	1.70
19	1.66	1.60	1.52	1.48	2.42	2.40	2.85	1.96	1.75	1.62	1.66	1.68
20	1.59	1.60	1.50	1.48	4.10	2.29	2.68	1.94	1.76	1.61	1.62	1.74
21	1.50	1.60	1.52	1.50	2.75	2.26	2.70	1.90	1.81	1.60	1.64	1.76
22	1.50	1.60	1.55	1.50	2.55	2.18	2.68	1.95	1.98	1.60	1.58	1.69
23	1.50	1.70	1.55	1.50	2.42	2.10	2.60	2.08	1.80	1.58	1.72	1.70
24	2.18	1.68	1.55	1.48	2.51	2.10	2.52	2.00	1.76	1.85	1.61	1.66
25	2.02	1.64	1.58	1.50	2.58	2.04	2.42	2.15	1.72	1.78	1.68	1.69
26	1.95	1.65	1.60	1.50	†4.36	2.00	2.36	2.55	1.76	1.68	1.72	1.70
27	1.85	1.69	1.54	1.50	2.95	2.00	2.31	2.46	1.70	1.62	1.65	1.82
28	1.85	1.70	1.55	1.50	2.75	2.02	2.26	2.45	1.70	1.60	1.58	1.72
29	1.80	1.70	1.52	1.50	-------	2.02	2.30	2.30	1.70	1.61	2.05	1.66
30	1.95	1.58	1.52	1.48	-------	2.00	2.22	2.28	1.78	1.84	1.70	1.64
31	1.95	-------	1.58	1.50	-------	2.08	-------	2.34	-------	1.68	1.69	-------

NOTES—†Maximum 5.0 feet at 9:00 a. m. ‡Minimum 1.35 feet.

SUSQUEHANNA BASIN—STATION NO. 21

BALD EAGLE CREEK AT BEECH CREEK STATION

DESCRIPTION OF STATION

Location.—At three span, steel, highway bridge at Beech Creek Station, Clinton County.

Records Available.—Discharge complete from June 24, 1910, to September 30, 1918. For other records on this creek see Bald Eagle Creek at Milesburg.

Drainage Area.—565 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge and is read twice daily by G. A. Rodgers.

Channel.—The right bank is about 35 feet above the bed of the creek, while the left bank is about 8 to 10 feet above the bed, which is composed of rocks, gravel and sand.

Discharge Measurements of Bald Eagle Creek at Beech Creek Station, Clinton County.
(Drainage area 565 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec. ft.	
25	Mar. 20	McDowell	666	3.40	1.459	Surf. & 0.6 method
26	July 19	Bowen	606	2.63	780	0.2 & 0.8 method
	1918					
27	Feb. 1	Reckord & Shade	256	2.20	189	Under ice cover
28	July 20	Reckord & Shade	414	1.62	219	0.6 method

Daily Mean Gage Heights, in feet, of Bald Eagle Creek at Beech Creek Station, Clinton County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.85	1.67	1.90	------	------	3.3	3.3	2.3	2.4	2.02	1.83	1.57
2	1.74	1.66	1.88	------	------	3.5	3.3	2.23	2.4	2.23	1.84	‡1.51
3	1.67	1.65	1.86	------	------	3.1	3.2	2.21	2.5	2.09	1.80	1.69
4	1.62	1.66	1.82	2.00	------	2.9	2.9	2.21	2.4	1.98	1.75	1.65
5	1.62	1.80	1.82	2.9	------	2.7	2.9	2.7	2.4	1.90	1.73	1.62
6	1.61	1.77	1.81	3.4	------	2.5	4.0	3.0	2.4	1.93	1.69	1.64
7	1.60	1.74	1.80	3.4	------	2.5	3.8	3.0	3.0	1.87	1.64	1.61
8	1.60	1.72	1.80	3.3	------	2.5	3.7	3.0	3.5	1.85	1.62	2.01
9	1.59	1.70	1.80	3.1	------	2.8	3.5	3.0	3.5	2.27	2.05	2.01
10	1.58	1.70	1.88	3.0	------	2.8	3.3	3.0	3.0	2.27	1.81	1.80
11	1.58	1.68	1.86	3.0	------	3.8	3.1	3.0	3.4	3.6	1.71	1.70
12	1.58	1.68	1.84	2.9	------	†6.2	2.9	2.8	3.1	3.1	1.78	1.61
13	1.63	1.66	1.84	2.9	------	4.4	2.8	2.6	2.8	2.7	1.69	1.57
14	1.70	1.64	1.83	2.9	------	4.2	2.7	2.6	2.7	2.6	2.7	1.63
15	1.68	1.64	1.83	*	------	3.7	2.6	2.5	2.6	2.4	2.4	1.61
16	1.66	1.62	1.82	------	------	3.6	2.5	2.4	2.6	2.4	2.5	1.62
17	1.66	1.61	*	------	------	3.9	2.5	2.3	2.4	2.4	2.3	1.59
18	1.65	1.61	------	------	------	3.9	2.4	2.3	2.3	2.3	2.08	1.59
19	1.64	1.60	------	------	------	3.6	2.4	2.3	2.27	2.6	1.94	1.63
20	1.66	1.59	------	------	------	3.4	2.9	2.23	2.19	2.13	1.92	1.60
21	1.70	1.58	------	------	------	3.3	2.6	2.21	2.12	2.06	1.85	1.56
22	1.78	1.57	------	------	2.6	3.2	2.4	2.19	2.03	2.01	1.79	1.59
23	1.90	1.58	------	------	2.3	3.2	2.3	2.5	1.97	2.09	1.75	1.52
24	1.88	1.74	------	------	3.8	4.7	2.2	2.3	2.19	2.03	1.89	1.53
25	1.82	1.72	------	------	3.0	4.1	2.3	2.25	2.07	1.95	1.81	1.53
26	1.74	1.67	------	------	2.8	3.7	2.3	2.23	1.95	1.93	1.73	1.53
27	1.72	1.64	------	------	4.2	3.7	2.3	2.23	2.5	2.6	1.65	1.53
28	1.71	1.63	------	------	3.9	3.8	2.3	2.3	2.4	2.17	1.63	1.51
29	1.70	1.80	------	------	------	3.5	2.3	2.6	2.4	2.02	1.67	1.53
30	1.68	1.93	------	------	------	3.4	2.24	2.6	2.18	1.93	1.75	1.53
31	1.68	------	------	------	------	3.4	------	2.5	------	1.89	1.65	------

NOTES—*Creek frozen December 17, 1916, to January 3, 1917, and January 15 to February 21, 1917, inclusive. †Maximum 6.6 feet at noon. ‡Minimum 1.50 feet at 8 a.m.

Daily Mean Gage Heights, in feet, of Bald Eagle Creek at Beech Creek Station, Clinton County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.51	2.9	1.76	2.4	2.26	4.2	2.15	2.6	3.6	2.02	1.70	2.15
2	1.53	2.8	1.73	2.4	2.29	4.0	2.12	2.5	3.1	1.96	1.88	1.90
3	1.53	2.6	1.71	2.4	2.29	3.9	2.19	2.4	2.9	1.83	1.55	1.72
4	1.61	2.5	1.68	2.4	2.28	3.6	2.10	2.3	2.6	1.79	1.50	1.69
5	1.63	2.4	1.66	2.4	2.28	3.5	2.05	2.4	2.7	1.76	1.48	1.65
6	1.62	2.3	1.64	2.4	2.27	3.6	1.99	2.5	2.5	1.74	1.48	1.98
7	1.61	2.23	1.62	2.4	2.27	3.5	1.95	2.28	2.6	1.74	1.47	1.90
8	1.65	2.17	*1.61	2.4	2.26	3.2	2.5	2.3	2.4	1.72	1.46	1.78
9	1.62	2.13	1.60	2.4	2.26	3.2	2.17	2.23	2.22	1.71	1.80	1.68
10	1.59	2.10	1.58	2.4	2.26	3.6	2.04	2.21	2.28	1.71	1.80	1.62
11	1.57	2.09	1.57	2.4	2.25	3.5	2.05	2.17	2.3	1.71	1.95	1.58
12	1.64	2.07	1.56	2.4	2.24	3.4	2.09	2.15	2.6	1.72	1.8.	1.58
13	1.71	2.05	1.56	2.4	4.5	3.3	2.7	3.3	2.4	1.72	1.72	3.7
14	1.66	2.03	1.54	2.4	5.9	7.2	4.8	2.9	2.22	1.72	1.88	3.5
15	1.63	2.00	1.54	2.4	7.0	6.1	5.7	2.9	2.10	1.70	1.72	1.98
16	1.63	1.96	1.54	2.4	4.4	4.6	5.4	2.7	2.05	1.66	1.63	1.89
17	1.62	1.93	1.53	2.4	3.5	4.0	4.9	2.6	2.02	1.68	1.54	2.4
18	1.61	1.90	1.52	2.4	3.2	3.6	4.6	2.4	1.98	1.64	1.47	2.7
19	1.76	1.87	1.52	2.4	3.6	3.3	4.2	2.4	1.90	1.64	1.44	2.4
20	2.6	1.85	1.50	2.4	7.5	3.1	3.7	2.3	1.87	1.63	1.44	3.8
21	2.25	1.88	1.50	2.4	5.6	2.9	3.7	2.4	1.87	1.71	1.42	3.3
22	2.19	1.93	1.49	2.4	4.4	2.8	4.1	2.4	3.7	1.75	1.40	2.9
23	2.11	1.91	1.48	2.4	3.9	2.7	3.8	3.3	3.0	1.70	1.62	2.5
24	3.6	1.89	1.48	2.3	4.1	2.6	3.6	2.9	2.6	1.66	1.52	2.3
25	4.8	1.87	1.48	2.3	4.3	2.6	3.3	2.9	2.3	1.60	1.45	2.18
26	3.8	1.84	1.47	2.3	†9.2	2.6	3.1	4.9	2.26	1.60	1.41	2.4
27	3.5	1.83	1.47	2.3	5.5	2.4	3.0	3.9	2.14	1.60	1.41	2.15
28	3.6	1.81	1.46	2.3	4.6	2.3	2.8	4.3	2.07	1.62	‡1.39	2.08
29	3.3	1.79	1.46	2.3	-------	2.22	2.7	3.6	2.18	1.70	3.2	1.98
30	3.4	1.77	1.45	2.3	-------	2.20	2.7	3.8	2.08	1.88	2.08	1.92
31	3.2	-------	1.44	2.3	-------	2.18	-------	4.0	-------	1.68	1.85	-------

NOTES—*Gage heights affected by ice December 8, 1917 to February 15, 1918 and discharge estimated from one discharge measurement under ice cover together with climatological records. †Maximum 9.5 feet at 2:00 p. m. ‡Minimum 1.38 feet.

Daily discharge in second-feet, of Bald Eagle Creek at Beech Creek Station, Clinton County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	295	213	320	185	348	1,370	1,370	670	640	387	285	174
2	243	209	310	248	375	1,580	1,370	521	640	521	290	‡154
3	213	205	300	320	320	1,180	1,280	507	715	429	270	221
4	193	209	280	375	520	1,020	1,020	507	640	364	248	205
6	193	270	280	1,020	500	865	1,020	865	640	320	238	193
6	189	256	275	1,470	715	715	2,140	1,100	640	356	221	201
7	185	243	270	1,470	640	715	1,910	1,100	1,100	365	201	189
8	185	234	270	1,370	570	715	1,800	1,100	1,580	295	193	381
9	182	225	310	1,180	500	940	1,580	1,100	1,370	521	405	381
10	178	225	310	1,100	435	940	1,370	1,100	1,100	549	275	270
11	178	217	300	1,100	405	1,910	1,180	1,100	1,470	1,680	230	225
12	178	217	290	1,020	375	†5,780	1,020	940	1,180	1,180	261	180
13	197	209	290	1,020	320	2,680	940	790	940	865	221	174
14	225	201	285	1,020	320	2,400	865	790	865	790	865	197
15	217	201	285	*790	270	1,800	790	715	790	640	649	189
16	209	193	280	570	270	1,680	715	640	790	640	715	193
17	209	189	*248	435	270	2,020	715	570	640	640	570	182
18	205	189	248	375	270	2,020	640	570	570	570	423	182
19	201	185	225	320	435	1,680	640	570	549	790	342	197
20	209	182	225	320	865	1,470	1,020	521	494	454	331	185
21	225	178	205	320	1,370	1,370	790	507	448	411	293	171
22	261	174	185	405	790	1,280	640	494	393	381	266	182
23	320	178	185	405	570	1,280	570	715	358	429	247	157
24	310	243	185	375	1,910	3,120	570	570	494	393	315	160
25	280	234	168	375	1,100	2,270	570	535	417	348	275	160
26	243	213	168	320	940	1,800	570	521	348	336	238	160
27	234	201	150	320	2,400	1,800	570	521	715	790	205	160
28	230	197	150	270	2,020	1,910	570	570	640	489	197	154
29	225	270	150	270	-------	1,580	570	790	640	387	213	160
30	217	336	150	295	-------	1,470	528	790	487	336	247	160
31	217	-------	150	320	-------	1,470	-------	715	-------	315	205	-------

NOTES— *Creek frozen December 17, 1916, to January 3, 1917, and January 15 to February 21, 1917, inclusive, and discharge estimated from climatological data. †Maximum=6,550 second-feet. ‡Minimum=150 second-feet.

Daily Discharge in second-feet, of Bald Eagle Creek at Beech Station, Clinton County, for the period October 1, 1916 to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	154	1,020	252	225	189	2,400	468	790	1,680	387	225	468
2	160	940	238	225	189	2,140	448	715	1,180	353	310	320
3	160	790	230	225	185	2,020	494	640	1,020	300	168	234
4	189	715	217	225	185	1,680	474	570	790	266	150	221
5	197	640	209	225	185	1,580	405	640	865	252	144	205
6	193	570	201	225	185	1,680	370	715	715	243	144	364
7	189	521	193	225	185	1,580	348	556	790	243	141	320
8	205	480	185	225	185	1,280	715	570	640	234	138	261
9	193	454	185	225	185	1,280	480	521	514	230	270	217
10	182	435	185	225	185	1,680	399	507	556	230	270	193
11	174	429	167	205	205	1,580	405	480	570	230	348	178
12	201	417	167	205	225	1,470	429	468	790	234	295	178
13	230	405	167	205	320	1,370	865	1,370	640	234	234	1,800
14	209	393	150	205	570	7,880	3,280	1,020	514	234	310	1,580
15	197	375	150	205	2,820	5,590	4,860	1,020	435	225	234	364
16	197	353	150	205	2,680	2,970	4,320	865	405	209	197	315
17	193	336	150	205	1,580	2,140	3,450	790	387	217	164	640
18	189	320	150	205	1,280	1,680	2,970	640	364	201	141	865
19	252	305	150	205	1,680	1,370	2,400	640	320	201	132	640
20	790	295	167	205	8,600	1,180	1,800	570	305	197	132	1,910
21	535	310	225	205	4,680	1,020	1,800	640	305	230	126	1,370
22	504	336	270	205	2,680	940	2,270	640	1,800	248	120	1,090
23	442	326	270	205	2,020	865	1,910	1,370	1,100	225	193	715
24	1,680	315	270	205	2,270	790	1,680	1,020	790	209	157	570
25	3,280	305	270	180	2,540	790	1,370	1,020	570	185	135	487
26	1,910	290	270	189	†12,900	790	1,180	3,450	542	185	123	640
27	1,580	285	247	189	4,500	640	1,100	2,020	461	185	123	468
28	1,680	275	247	189	2,970	570	940	2,540	417	193	‡118	423
29	1,370	256	225	180	-------	514	865	1,680	487	225	1,280	364
30	1,470	256	225	189	-------	500	865	1,910	423	310	423	331
31	1,280	-------	225	189	-------	487	-------	2,140	-------	217	295	-------

NOTES—*Gage heights affected by ice December 8, 1917 to February 15, 1918 and discharge estimated from one discharge measurement under ice cover together with climatological records †Maximum 13,700 second-feet from hydrograph at 2:00 p. m. ‡Minimum 115 second-feet.

Estimated Monthly Discharge of Bald Eagle Creek at Beech Creek Station, Clinton County
(Drainage area 565 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October,	320	178	221	0.39	0.45
November,	336	174	217	0.38	0.42
December,	320	150	240	0.42	0.48
January,	1,470	185	625	1.11	1.28
February,	2,400	270	701	1.24	1.29
March,	†5,780	715	1,700	3.01	3.47
April,	2,140	528	1,040	1.84	2.05
May,	1,100	494	723	1.28	1.48
June,	1,580	348	743	1.32	1.47
July,	1,680	295	545	0.96	1.11
August,	865	193	320	0.57	0.66
September,	381	‡154	197	0.35	0.39
The year.	5,780	150	606	1.07	14.55

NOTES—Creek frozen December 17, 1916 to January 3, 1917, and January 15 to February 21, 1917, inclusive, and discharge estimated from climatological data. †Maximum = 6,550 second-feet, March 12, 1917. ‡Minimum = 150 second-feet, September 2, 1917.

Estimated Monthly Discharge of Bald Eagle Creek at Beech Creek Station, Clinton County.
(Drainage area 565 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October,	3,280	154	654	1.16	1.34
November,	1,020	256	439	0.78	0.87
December,	----------	----------	207	0.37	0.43
January,	----------	----------	208	0.37	0.43
February	12,900	----------	2,010	3.56	3.71
March	7,880	487	1,690	2.99	3.45
April	4,860	348	1,440	2.54	2.83
May	3,450	468	1,050	1.86	2.14
June	1,800	305	679	1.20	1.34
July	387	185	237	0.42	0.48
August	1,280	118	234	0.41	0.47
September	1,910	178	589	1.04	1.16
The year	12,900	----------	777	1.38	18.65

NOTE—Gage heights affected by ice December 8, 1917 to February 15, 1918, and discharge estimated from one discharge measurement under ice cover to-gether with climatological records. Maximum 13,700 second-feet February 26 Minimum 115 second-feet August 28.

SUSQUEHANNA BASIN—STATION NO. 22

PINE CREEK AT CEDAR RUN

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge near Cedar Run railroad station, Lycoming County.

Records Available.—Discharge measurements and gage heights from July 19, to September 30, 1918. For other records on this creek see Pine Creek at Waterville.

Drainage Area.—590 square miles.

Gage.—A standard chain gage, whose elevation of zero is 781.96 feet above mean sea level, is located on the downstream handrail of the bridge and is read twice daily by C. R. Nivison.

Channel.—Both banks are of a medium height and the bed is composed of gravel.

Remarks.—Gage heights at this station were observed by the U. S. Weather Bureau from November 1, 1904, to June 30, 1908.

Discharge Measurements of Pine Creek at Cedar Run, Lycoming County.
(Drainage area 590 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1918		Sq.ft.	Feet	Sec.-ft.	
1	Sept.20	Hosmer & Shade,	1,327	4.20	2,960	Surface method
2	Sept. 21	Hosmer & Shade,	1,283	3.98	2,748	Surface method
3	Sept. 23	Hosmer & Shade,	1,066	3.12	1,561	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Pine Creek at Cedar Run, Lycoming County, for the year ending September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1											1.54	1.78
2											1.47	1.75
3											1.42	1.62
4											1.46	1.60
5											1.74	1.60
6											1.72	2.24
7											1.56	1.95
8											1.50	1.88
9											1.53	1.78
10											1.74	1.74
11											2.42	1.70
12											2.13	1.78
13											1.94	2.84
14											1.87	2.66
15											2.28	2.46
16											2.00	2.28
17											1.90	3.26
18											1.80	3.08
19										1.45	1.72	2.91
20										1.42	1.67	4.24
21										1.40	1.61	3.88
22										1.38	1.57	3.50
23										1.38	1.52	3.09
24										1.84	1.52	2.85
25										2.10	1.48	2.64
26										1.81	1.47	2.87
27										1.62	1.45	2.65
28										1.52	1.43	2.48
29										1.48	1.50	2.35
30										1.54	1.66	2.27
31										1.72	1.52	

SUSQUEHANNA BASIN—STATION NO. 23

PINE CREEK NEAR WATERVILLE

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge three-quarters of a mile above railroad station at Waterville, Lycoming County.

Records Available.—Discharge complete from July 15, 1908, to September 30, 1915, and from July 12, 1916, to September 30, 1918. For other records on this creek see Pine Creek at Cedar Run.

Drainage Area.—750 square miles.

Gage.—A standard chain gage, whose elevation of zero is 608.04 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by E. Homer Love.

Channel.—The right bank never overflows except in extreme stages, such as the floods of 1865 and 1889; the left is high and not subject to overflow, and the bed is composed of gravel.

Discharge Measurement of Pine Creek near Waterville, Lycoming County.
(Drainage area 750 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
37	July 20	Bowen	567	2.96	1,712	0.2 & 0.8 method.
	1918					
38	Jan. 31	Reckord & Shade	129	2.52	124	Under complete ice cover.
39	July 19	Reckord & Shade	194	1.10	164	Wading at bridge section.
40	Sept. 21	Hosmer & Shade	908	4.18	3,922	Surface method.

Daily Mean Gage Heights, in feet, of Pine Creek near Waterville, Lycoming County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.6	1.1	1.8	------	------	3.2	3.2	1.8	4.2	3.7	1.6	2.4
2	1.4	1.1	1.6	------	------	3.0	3.3	1.8	4.0	3.6	1.6	2.7
3	1.2	1.0	1.6	------	------	2.8	4.4	1.8	3.9	3.3	1.5	2.3
4	1.1	1.0	2.0	------	------	2.4	3.9	1.7	3.7	2.9	1.5	2.0
5	1.1	1.0	1.9	------	------	2.3	3.7	2.2	3.1	2.7	1.4	1.9
6	1.0	1.2	1.9	------	------	2.2	4.1	2.9	3.4	2.9	1.3	2.1
7	1.0	1.3	1.8	------	------	3.0	4.4	2.9	4.0	3.0	1.2	1.9
8	‡0.9	1.3	1.7	------	------	3.1	3.6	3.1	5.7	3.2	1.2	1.8
9	0.9	1.3	1.8	------	------	2.4	3.1	3.1	4.9	3.4	3.9	2.0
10	0.9	1.2	1.8	------	------	2.1	2.9	3.3	4.6	3.7	2.6	1.9
11	0.9	1.2	1.7	------	------	3.3	2.8	3.2	4.2	3.6	2.1	1.8
12	0.9	1.3	1.6	------	------	†5.7	2.7	3.0	3.9	3.4	1.8	1.7
13	0.9	1.2	1.6	------	------	4.3	2.5	3.0	3.1	3.2	1.7	1.7
14	1.0	1.2	1.6	------	------	3.9	2.3	2.8	2.8	2.8	2.5	1.6
15	1.1	1.2	*	------	------	3.4	2.1	2.5	2.7	2.8	2.9	1.4
16	1.1	1.2	------	------	------	3.3	2.1	2.3	2.5	2.7	3.7	1.3
17	1.2	1.2	------	------	------	3.6	2.1	2.2	2.4	2.7	3.0	1.3
18	1.2	1.2	------	------	------	3.7	2.0	2.1	2.2	2.2	2.8	1.2
19	1.4	1.2	------	------	------	2.9	2.0	2.0	2.1	2.0	2.5	1.2
20	1.8	1.2	------	------	------	2.8	2.2	2.0	2.1	2.9	2.2	1.2
21	2.0	1.1	------	------	------	2.8	2.2	2.0	2.3	2.5	2.0	1.2
22	2.2	1.1	------	------	------	3.1	2.2	2.2	2.1	2.5	1.9	2.3
23	1.9	1.2	------	------	------	3.7	2.1	2.5	1.9	2.3	2.2	2.0
24	1.6	1.6	------	------	------	5.0	2.0	2.8	2.0	2.2	2.7	1.7
25	1.4	1.8	------	------	------	5.5	2.0	2.6	2.3	2.1	2.7	1.5
26	1.4	1.7	------	------	------	4.9	1.9	2.4	2.6	1.8	2.3	1.3
27	1.3	1.6	------	------	------	4.7	1.9	2.6	2.4	1.7	2.0	1.2
28	1.3	1.6	------	------	------	5.4	1.8	3.2	2.4	1.7	1.8	1.2
29	1.2	1.8	------	------	------	4.5	1.8	4.1	2.4	1.7	2.0	1.1
30	1.2	1.8	------	------	------	4.0	1.8	3.9	2.7	2.3	2.4	1.0
31	1.2	------	------	------	------	3.8	------	4.0	------	1.7	2.6	------

NOTES—*Creek frozen December 15, 1916, to February 28, 1917, inclusive. †Maximum 6.7 feet at 5 a. m. estimated from hydrograph.
‡Minimum 0.9 feet October 8 to 13, 1916, inclusive.

Daily Mean Gage Heights, in feet, of Pine Creek near Waterville, Lycoming County, for the period October 1, 1916 to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.0	4.0	1.4	2.2	2.5	7.9	2.0	2.7	2.7	1.8	1.2	1.0
2	1.0	3.7	1.3	2.2	2.5	5.8	2.0	2.6	2.6	1.8	1.2	1.2
3	‡0.9	3.4	1.3	2.2	2.5	4.8	2.0	2.5	2.6	1.6	1.2	1.2
4	1.1	3.1	1.3	2.2	2.5	3.9	2.0	2.4	2.6	1.5	1.2	1.2
5	1.6	2.6	1.3	2.2	2.5	3.6	2.0	2.4	2.6	1.4	1.2	1.1
6	1.4	2.4	1.5	2.2	2.5	3.6	2.0	2.4	2.7	1.4	1.2	1.4
7	1.4	2.3	*1.5	2.3	2.5	3.9	2.0	2.2	2.6	1.4	1.1	1.8
8	1.2	2.1	1.5	2.3	2.5	3.5	2.1	2.2	2.6	1.4	1.1	1.6
9	1.1	2.0	1.7	2.3	2.5	3.6	2.5	2.2	2.4	1.4	1.0	1.6
10	1.0	1.9	1.7	2.4	2.5	4.5	2.5	2.2	2.3	1.2	1.0	1.6
11	1.8	1.9	1.7	2.4	2.6	3.7	2.5	2.2	2.4	1.2	2.2	1.5
12	2.7	1.9	2.0	2.4	2.9	3.5	2.6	2.2	2.5	1.2	2.0	1.5
13	2.3	1.8	2.0	2.5	4.6	3.8	2.7	2.4	2.3	1.2	1.8	2.8
14	1.9	1.8	2.0	2.7	3.6	†7.1	3.8	2.7	2.2	1.2	1.6	2.2
15	1.8	1.7	2.0	2.7	3.5	8.6	5.5	2.6	2.2	1.2	1.5	2.0
16	1.7	1.7	2.0	2.7	3.4	5.7	6.1	2.4	2.2	1.2	1.4	2.0
17	1.5	1.6	2.0	2.7	2.9	4.8	6.1	2.4	2.2	1.2	1.4	2.4
18	1.4	1.6	2.0	2.7	2.5	3.9	6.2	2.4	2.0	1.0	1.4	3.6
19	1.3	1.6	2.0	2.7	2.4	3.5	5.0	2.4	2.0	1.1	1.3	3.0
20	5.1	1.6	2.0	2.7	9.5	3.4	4.3	2.7	1.8	1.1	1.2	4.2
21	4.3	1.6	2.0	2.7	5.6	3.4	4.0	3.8	1.6	1.1	1.2	4.3
22	3.4	1.6	2.0	2.7	3.9	3.4	3.8	3.6	2.8	1.1	1.1	3.4
23	3.1	1.7	2.0	2.7	3.7	3.3	3.4	6.2	2.6	1.0	1.1	3.0
24	3.5	1.7	2.0	2.7	3.5	3.1	3.1	4.9	2.4	1.0	1.0	3.0
25	5.0	1.6	2.0	2.7	3.4	2.8	3.0	4.1	2.3	2.5	1.0	2.8
26	4.2	1.5	2.0	2.7	7.3	2.6	2.9	3.6	2.2	2.3	1.0	2.7
27	4.2	1.7	2.2	2.7	5.2	2.5	2.8	3.2	2.0	2.0	0.9	2.6
28	5.2	2.6	2.2	2.7	4.3	2.4	2.6	2.9	1.8	1.8	1.2	2.4
29	5.1	2.4	2.2	2.7	-------	2.3	2.5	2.6	1.8	1.6	1.1	2.2
30	4.8	1.9	2.2	2.7	-------	2.2	2.7	3.2	1.8	1.4	1.0	2.1
31	4.6	-------	2.2	2.6	-------	2.0	-------	3.0	-------	1.3	1.0	-------

NOTES—*Gage heights affected by Ice December 7, 1917 to February 13, 1918, and discharge estimated from one discharge measurement under ice cover together with climatological records.
†Maximum 12.3 feet at 7:00 p. m.
‡Minimum 0.88 feet.

Daily discharge, in second-feet of Pine Creek near Waterville, Lycoming County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	380	120	520	160	380	2,080	2,080	520	3,580	2,790	380	1,100
2	260	120	380	160	380	1,820	2,220	520	3,250	2,640	380	1,460
3	160	90	380	160	320	1,580	3,940	520	3,090	2,220	320	990
4	120	90	690	160	320	1,100	3,090	450	2,790	1,700	320	690
5	120	90	600	160	260	990	2,790	890	1,960	1,460	260	600
6	90	160	600	210	260	890	3,410	1,700	2,360	1,700	210	790
7	90	210	520	520	260	1,820	3,940	1,700	3,250	1,820	160	600
8	‡70	210	450	1,340	260	1,960	2,640	1,960	6,910	2,080	160	520
9	70	210	520	1,580	260	1,100	1,960	1,960	4,970	2,360	3,090	690
10	70	160	520	1,220	260	790	1,700	2,220	4,320	2,790	1,340	600
11	70	160	450	790	260	2,220	1,580	2,080	3,580	2,640	790	520
12	70	210	380	450	260	†6,910	1,460	1,820	3,090	2,360	520	450
13	70	160	380	380	260	3,750	1,220	1,820	1,960	2,080	450	450
14	90	160	380	320	260	3,000	990	1,580	1,580	1,580	1,220	380
15	120	160	*320	320	260	2,360	790	1,220	1,460	1,580	1,700	260
16	120	160	260	320	260	2,220	790	990	1,220	1,460	2,790	210
17	160	160	210	260	260	2,640	790	890	1,100	1,460	1,820	210
18	160	160	210	260	260	2,790	690	790	890	890	1,580	160
19	260	160	160	260	260	1,700	690	690	790	690	1,220	160
20	520	160	160	260	260	1,580	890	690	790	1,700	890	160
21	690	120	160	260	320	1,580	890	690	990	1,220	690	160
22	890	120	160	320	320	1,960	890	890	790	1,220	600	990
23	600	160	160	380	380	2,790	790	1,220	600	990	890	690
24	380	380	160	520	450	5,200	690	1,580	690	890	1,460	450
25	260	520	160	450	600	6,410	690	1,340	990	790	1,460	320
26	260	450	160	450	1,100	4,970	600	1,100	1,340	520	990	210
27	210	380	160	380	1,820	4,520	600	1,340	1,100	450	690	160
28	210	380	160	320	2,220	6,160	520	2,080	1,100	450	520	160
29	160	520	160	450	-------	4,130	520	3,410	1,100	450	690	120
30	160	520	160	520	-------	3,250	520	3,090	1,460	990	1,100	90
31	160	-------	160	450	-------	2,940	-------	3,250	-------	450	1,340	-------

NOTES—*Creek frozen December 15, 1916, to February 28, 1917, inclusive, and discharge estimated from climatological data. †Maximum=9,500 second-feet. ‡Minimum=70 second-feet.

Daily discharge, in second-feet, of Pine Creek near Waterville, Lycoming County, for the period October 1, 1916 to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	120	3,460	325	210	124	12,900	770	1,520	1,520	600	210	120
2	120	2,950	265	210	120	7,260	770	1,400	1,400	600	210	210
3	‡90	2,470	265	210	120	4,990	770	1,280	1,400	455	210	210
4	160	2,040	265	210	120	3,290	770	1,170	1,400	390	210	210
5	445	1,400	265	210	120	2,790	770	1,170	1,400	325	210	160
6	325	1,170	390	210	120	2,790	770	1,170	1,520	325	210	325
7	325	1,060	*325	210	105	3,290	770	960	1,400	325	160	600
8	210	860	265	210	105	2,630	860	960	1,400	325	160	455
9	160	770	265	210	105	2,790	1,280	960	1,170	325	120	455
10	120	680	265	210	120	4,390	1,280	960	1,060	210	120	455
11	600	680	265	210	140	3,950	1,280	960	1,170	210	960	390
12	1,520	680	237	210	210	2,630	1,400	960	1,280	210	770	390
13	1,060	600	237	185	390	3,120	1,520	1,170	1,060	210	600	1,640
14	680	600	237	185	2,790	†10,600	3,120	1,520	960	210	455	960
15	600	525	237	185	2,630	15,100	6,540	1,400	960	210	390	770
16	525	525	237	185	2,470	7,020	8,000	1,170	960	210	325	770
17	390	455	237	185	1,770	4,990	8,000	1,170	960	210	325	1,170
18	325	455	237	185	1,280	3,290	8,250	1,170	770	120	325	2,790
19	265	455	237	185	1,170	2,630	5,410	1,170	770	160	265	1,900
20	5,630	455	237	185	18,100	2,470	4,010	1,170	600	160	210	3,820
21	4,010	455	237	160	6,780	2,470	3,460	3,120	455	160	210	4,010
22	2,470	455	237	160	3,290	2,470	3,120	2,790	1,640	160	160	2,470
23	2,040	525	237	160	2,950	2,320	2,470	8,250	1,400	120	160	1,900
24	2,630	525	237	160	2,630	2,040	2,040	5,200	1,170	120	120	1,900
25	5,410	455	237	160	2,470	1,640	1,900	3,640	1,060	1,280	120	1,640
26	3,820	390	237	160	11,200	1,400	1,770	2,790	960	1,060	120	1,520
27	3,820	525	237	160	5,850	1,280	1,640	2,180	770	770	90	1,400
28	5,850	1,400	237	160	4,010	1,170	1,400	1,770	600	600	210	1,170
29	5,630	1,170	210	160	-------	1,060	1,280	1,400	600	455	160	960
30	4,990	680	210	140	-------	960	1,520	2,180	600	325	120	860
31	4,590	-------	210	125	-------	770	-------	1,900	-------	265	120	-------

NOTES—*Gage heights affected by ice December 7, 1917, to February 13, 1918, and discharge estimated from one discharge measurement under ice cover together with climatological records. †Maximum 28,700 second-feet from hydrograph at 7:00 p. m. ‡Minimum 85 second-feet.

Estimated Monthly Discharge of Pine Creek near Waterville, Lycoming County.
(Drainage area 750 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet Per square mile	Depth in inches
1916-1917					
October	890	‡70	227	0.30	0.35
November	520	90	222	0.30	0.34
December	-------	-------	318	0.42	0.48
January	-------	-------	445	0.59	0.68
February	-------	-------	456	0.61	0.64
March	†6,410	790	2,820	3.76	4.34
April	3,940	520	1,480	1.97	2.20
May	3,410	450	1,450	1.93	2.22
June	6,910	600	2,100	2.80	3.12
July	2,790	450	1,500	2.00	2.31
August	3,090	160	969	1.29	1.49
September	1,460	90	478	0.64	0.71
The year	6,910	70	1,040	1.39	18.88

NOTES—Creek frozen December 15, 1916, to February 28, 1917, inclusive, and discharge estimated from climatological records. †Maximum=9,500 second-feet, March 12, 1917. ‡Minimum=70 second-feet, October 8 to 13, 1916, inclusive.

Estimated Monthly Discharge of Pine Creek near Waterville, Lycoming County.
(Drainage area 750 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet Per square mile	Depth in inches
1917-1918					
October	5,850	90	1,960	2.53	2.92
November	3,460	390	962	1.28	1.43
Decembe	390		252	0.34	0.39
January			184	0.25	0.29
February	18,100		2,550	3.40	3.54
Mareh	15,100	770	3,850	5.13	5.91
April	8,250	770	2,560	3.41	3.80
May	8,250	960	1,890	2.52	2.91
June	1,640	455	1,080	1.44	1.61
July	1,280	120	358	0.48	0.55
August	960	90	259	0.35	0.40
September	4,010	120	1,190	1.59	1.77
The year	18,100	90	1,410	1.89	25.52

NOTES—Gage heights affected by ice December 7, 1917, to February 13, 1918, and discharge estimated from one discharge measurement under ice cover together with climatological records. Maximum 28,700 second-feet March 14. Minimum 85 second-feet October 3.

SUSQUEHANNA BASIN—STATION NO. 24

LYCOMING CREEK NEAR TROUT RUN

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge about 2½ miles above Trout Run, Lycoming County.

Records Available.—Discharge complete from December 4, 1913, to September 30, 1916, and discharge measurements and gage heights from October 1, 1916, to September 30, 1918. For other records on this creek at Bridge No. 2 near Williamsport see 1911, 1912 and 1913 Reports of the Water Supply Commission.

Drainage Area.—185 square miles.

Gage.—A standard chain gage, whose elevation of zero is 693.4 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by Orpha Apker.

Channel.—The right bank is of medium height and overflows during extreme stages; the left is high and does not overflow, and the bed is composed of gravel and sand and is very uniform.

Discharge Measurement of Lycoming Creek near Trout Run, Lycoming County.
(Drainage area 185 square miles)

No.	Date	Hydrographer	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
39	July 18	Bowen	86	2.19	73	0.6 method
	1918					
40	Jan. 30	Reckord & Shade	63	2.88	46	Under ice cover
41	July 17	Reckord & Shade	60	1.90	34	Wading at bridge

Daily Mean Gage Heights, in feet, of Lycoming Creek near Trout Run, Lycoming County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	3.2	2.50	2.98	2.34	2.62	3.2	4.6	2.60	3.8	2.54	2.65	3.1
2	2.92	2.48	2.88	2.32	2.52	2.96	4.7	2.52	3.7	2.48	2.58	2.95
3	2.72	2.42	2.78	2.32	2.58	2.92	4.6	2.48	3.6	2.40	2.42	2.88
4	2.60	2.40	2.80	2.36	2.75	2.78	4.1	2.48	3.4	2.32	2.32	2.75
5	2.48	2.40	2.82	2.86	2.78	2.72	4.0	2.98	3.4	2.30	2.22	2.68
6	2.45	2.35	2.75	3.8	2.92	2.75	5.0	3.3	3.6	2.26	2.25	2.60
7	2.41	2.35	2.62	3.3	2.70	2.70	4.8	3.3	4.8	2.25	2.30	2.59
8	2.30	2.35	2.58	3.1	2.60	2.62	4.6	3.2	4.7	2.21	3.4	2.52
9	2.32	2.30	2.64	3.1	2.52	2.72	4.2	3.2	4.0	2.22	†7.1	2.52
10	2.30	2.31	2.60	3.2	2.60	2.78	3.9	3.4	3.8	2.32	4.8	2.42
11	2.25	2.30	2.55	2.94	2.58	2.85	3.7	3.3	3.8	2.32	3.4	2.38
12	2.19	2.29	2.50	2.85	2.58	4.8	3.7	3.2	3.5	2.25	3.1	2.32
13	2.20	2.28	2.46	3.0	2.62	3.7	3.6	3.1	3.2	2.20	3.0	2.30
14	2.38	2.30	2.45	4.7	2.70	3.6	3.4	3.0	3.2	2.28	4.4	2.26
15	2.45	2.30	*2.39	4.2	2.64	3.4	3.3	2.85	3.1	2.28	4.0	2.22
16	2.42	2.29	2.42	3.9	2.62	3.3	3.2	2.80	2.92	2.20	3.6	2.20
17	2.32	2.26	2.58	3.4	2.68	3.5	3.1	2.80	2.82	2.25	3.8	2.18
18	2.25	2.24	2.60	3.3	2.62	3.4	3.0	2.80	2.75	2.20	3.9	2.16
19	2.35	2.25	2.55	3.0	2.52	3.3	2.98	2.78	2.60	2.26	3.9	2.14
20	3.7	2.25	2.60	2.96	2.54	3.1	2.98	2.82	2.65	2.30	3.8	2.10
21	4.4	2.20	2.52	2.90	2.45	3.2	2.92	2.80	2.60	2.28	3.8	2.10
22	3.6	2.15	2.58	2.98	2.42	3.3	2.82	2.85	2.52	2.70	3.7	2.10
23	3.3	2.80	2.60	2.84	2.40	3.8	2.79	2.88	2.58	3.2	3.0	2.09
24	3.1	3.2	2.52	2.74	2.30	5.4	2.72	2.78	2.90	3.9	3.8	2.08
25	3.0	2.82	2.42	2.68	2.38	5.2	2.70	2.68	2.70	3.4	3.5	2.06
26	2.88	2.65	2.44	2.60	2.45	5.2	2.65	2.65	2.52	2.82	3.2	2.05
27	2.72	2.60	2.42	*2.70	3.4	6.4	2.61	2.72	2.95	2.60	2.72	2.02
28	2.68	2.65	2.41	2.68	3.6	6.3	2.58	3.1	2.70	2.48	2.82	‡2.01
29	2.62	2.66	2.38	2.66	-------	5.0	2.52	5.6	2.64	3.7	2.82	2.00
30	2.55	2.72	2.48	2.62	-------	4.6	2.52	5.0	2.58	4.1	3.6	2.00
31	2.50	-------	2.70	2.65	-------	4.3	-------	4.3	-------	2.92	3.4	-------

NOTES—*Creek frozen December 15, 1916 to January 15, 1917, and January 27 to February 27, 1917, inclusive. †Maximum 9.3 feet at 4 a. m. estimated from hydrograph. ‡Minimum 2.00 feet September 28 p. m. to 30, 1917, inclusive.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.97	4.3	2.33	2.54	2.84	6.0	2.81	3.3	4.0	2.32	2.09	2.12
2	1.99	3.9	2.37	2.59	2.64	4.8	2.75	3.1	3.2	2.19	2.02	2.11
3	2.01	3.7	2.35	2.54	2.77	4.5	3.1	3.1	2.95	2.12	1.92	2.08
4	2.02	3.4	2.31	2.56	2.78	4.2	3.1	3.2	2.75	2.05	1.89	2.02
5	1.17	3.2	2.27	2.56	2.80	4.1	2.99	3.5	2.71	2.03	2.38	2.02
6	2.31	3.1	2.20	2.66	2.80	4.1	2.91	3.8	2.65	2.15	2.22	3.2
7	2.09	2.98	2.23	2.84	2.85	4.1	2.81	3.5	3.1	2.05	2.08	2.62
8	2.09	2.91	*2.40	2.79	2.77	3.9	2.81	5.0	2.85	1.99	2.00	2.36
9	2.17	2.86	2.60	2.76	2.84	3.7	3.5	2.87	2.75	1.97	2.22	2.28
10	2.13	2.78	2.60	2.74	2.80	4.7	3.8	2.80	2.65	1.99	2.31	2.18
11	2.07	2.66	2.55	2.74	2.72	4.3	3.4	2.76	2.45	1.95	2.82	2.08
12	2.13	2.62	2.47	2.66	2.72	3.9	3.4	2.73	2.89	1.92	2.46	2.14
13	2.79	2.54	2.45	2.59	3.9	4.1	3.5	5.2	2.65	1.94	2.32	3.5
14	2.33	2.48	2.53	3.2	4.3	†9.1	4.3	5.3	2.55	1.98	2.79	2.85
15	2.35	2.46	2.67	3.2	4.9	6.8	5.6	4.5	2.39	1.95	2.48	2.68
16	2.25	2.46	2.63	3.2	5.1	5.0	5.8	4.0	2.32	1.95	2.32	2.52
17	2.19	2.46	2.60	3.2	3.6	4.7	6.2	3.7	2.27	1.92	2.24	3.6
18	2.13	2.42	2.60	3.0	3.7	4.5	5.6	3.5	2.22	1.99	2.12	3.8
19	2.75	2.42	2.65	2.89	3.7	4.6	4.8	3.3	2.17	1.96	2.02	3.7
20	3.3	2.38	2.67	2.79	6.1	4.8	4.3	3.2	2.17	1.92	2.00	3.7
21	3.1	2.41	2.70	2.89	4.5	4.8	4.3	5.9	2.22	1.88	2.00	4.1
22	3.0	2.54	2.60	2.92	3.9	4.5	4.2	4.5	2.25	‡1.82	2.00	3.7
23	3.0	2.64	2.40	2.94	3.8	4.1	4.2	5.4	2.75	‡1.82	1.96	3.4
24	4.0	2.54	2.33	2.79	3.5	3.9	4.0	4.5	2.47	‡2.00	1.92	3.2
25	4.8	2.34	2.33	2.76	3.4	4.2	3.8	4.2	2.29	2.65	1.90	3.0
26	4.6	2.36	2.45	2.79	8.6	3.5	3.6	3.9	2.25	2.22	1.86	3.6
27	2.72	2.66	2.42	*2.70	3.4	6.4	2.61	2.72	2.95	2.60	2.92	2.02
28	4.4	2.16	2.43	2.76	4.7	3.1	3.3	3.5	2.17	2.00	‡1.80	2.92
29	4.3	2.11	2.35	2.82	-------	3.0	3.2	3.3	2.19	1.95	2.22	2.79
30	5.9	2.10	2.45	2.90	-------	3.0	3.4	4.4	2.29	2.08	2.18	2.71
31	4.9	-------	2.50	2.86	-------	2.90	-------	4.1	-------	2.19	2.12	-------

NOTES—*Gage heights affected by ice December 8, 1917 to February 20, 1918. †Maximum 10.2 feet at 1:00 p. m. ‡Minimum 1.80 feet.

SUSQUEHANNA BASIN—STATION NO. 25.

WEST BRANCH SUSQUEHANNA RIVER AT WILLIAMSPORT

DESCRIPTION OF STATION

Location.—At five span, steel, through truss, highway bridge at Market Street, Williamsport, Lycoming County.

Records Available.—Discharge complete from March 1, 1895, to September 30, 1918. For other records on this river see West Branch Susquehanna River at Bower, Clearfield, Lewisburg; also West Branch Susquehanna River at Allenwood in the 1910-11 Report of the Water Supply Commission.

Drainage Area.—5,670 square miles.

Gage.—A standard chain gage, whose elevation of zero is 494.55 feet above mean sea level, is located on the upstream side of the bridge and is read twice daily by Jacob V. April.

Channel.—Both banks are high and rocky, and the bed is composed of gravel and silt.

Discharge Measurement of West Branch Susquehanna River at Williamsport, Lycoming County.
(Drainage area 5,670 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
39	July 17	Bowen	5,547	3.74	8,822	0.2 & 0.8 method
	1918					
40	July 16	Reckord and Shade	3,150	0.78	1,532	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of West Branch Susquehanna River at Williamsport, Lycoming County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916–1917												
1	2.2	0.8	1.7	1.3	3.4	7.3	6.0	2.2	5.5	3.5	2.1	2.1
2	1.4	0.8	1.8	1.4	3.1	6.9	5.7	2.1	5.3	3.6	1.8	1.9
3	1.2	0.8	1.8	1.8	2.9	6.6	6.0	2.1	5.3	3.4	1.5	2.1
4	0.8	0.8	1.8	1.8	2.7	5.6	6.5	2.0	4.9	3.2	1.4	2.0
5	0.45	0.8	2.3	1.9	2.5	4.8	6.0	1.9	4.4	2.9	1.1	1.6
6	0.40	0.8	2.3	3.7	2.4	4.2	6.3	2.0	4.0	2.7	1.0	1.4
7	0.37	0.8	2.2	4.4	2.2	3.8	7.7	2.7	4.2	2.4	1.0	1.2
8	0.36	0.8	2.1	6.0	2.0	3.5	7.5	5.2	9.3	2.1	1.0	1.3
9	0.34	0.8	1.9	5.1	2.0	3.1	6.8	5.1	9.2	2.0	5.0	1.5
10	0.31	0.8	1.8	4.7	1.9	3.0	6.2	5.1	8.1	2.5	3.7	1.5
11	0.27	0.7	1.8	4.4	1.8	3.9	5.8	5.2	7.1	3.3	2.6	1.5
12	0.25	0.7	1.7	3.8	1.8	6.7	5.4	5.2	7.4	5.3	2.2	1.7
13	‡0.25	0.7	1.6	3.6	1.8	†11.1	5.0	5.0	6.1	4.7	1.9	1.4
14	0.27	0.7	1.5	3.2	1.7	9.5	4.7	4.8	5.0	4.1	2.4	1.3
15	0.31	0.7	1.4	3.0	1.7	7.8	4.4	4.4	4.4	4.1	5.3	1.2
16	0.31	0.6	1.2	3.2	1.7	6.9	4.0	4.0	4.0	3.9	7.6	1.2
17	0.33	0.7	1.1	3.3	1.6	6.6	3.8	3.5	3.8	3.7	6.1	1.1
18	0.32	0.6	1.0	3.5	1.6	7.2	3.4	3.2	3.5	3.4	4.5	0.9
19	0.41	0.6	1.0	3.5	1.6	7.2	3.0	2.9	3.3	3.8	3.5	0.9
20	1.2	0.6	1.0	3.5	2.2	6.1	2.8	2.7	2.9	3.6	3.0	0.8
21	2.0	0.7	1.0	3.5	2.1	5.7	2.9	2.5	2.5	3.7	2.4	0.8
22	2.7	0.6	1.0	3.4	2.1	5.4	3.0	2.6	2.3	3.4	2.0	0.9
23	2.6	0.6	1.0	3.2	2.1	5.6	2.8	2.7	2.0	3.4	1.8	0.9
24	2.4	0.6	1.0	4.8	2.2	6.3	2.6	3.1	1.8	3.1	3.5	0.8
25	2.0	0.7	1.0	4.8	2.7	10.1	2.5	3.6	1.7	3.0	3.1	0.7
26	1.6	0.8	1.0	4.2	3.3	9.5	2.4	3.7	1.7	2.7	2.4	0.6
27	1.2	0.8	0.9	3.8	4.3	8.8	2.3	3.6	2.3	2.5	2.0	0.5
28	1.1	0.8	1.0	3.2	6.4	9.0	2.3	3.5	3.6	3.2	1.7	0.5
29	1.0	1.0	1.1	2.5	-------	8.4	2.3	4.4	3.8	2.8	1.5	0.48
30	1.0	1.4	1.3	2.4	-------	7.4	2.3	6.0	3.4	2.8	2.0	0.40
31	0.9	-------	1.3	2.9	-------	6.4	-------	5.8	-------	2.5	2.4	-------

NOTES—†Maximum 11.6 feet at 4 a. m. estimated from hydrograph. ‡Minimum 0.24 feet at 8 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917–1918												
1	0.45	7.7	1.2	1.5	1.5	8.3	3.3	3.9	6.6	3.4	0.8	1.8
2	0.46	6.7	1.1	1.5	1.5	11.0	3.0	3.8	5.7	2.8	0.8	1.7
3	0.46	5.8	1.0	1.6	1.5	9.5	2.6	3.5	4.9	2.3	0.6	2.8
4	0.46	5.1	1.0	1.6	1.5	8.6	2.6	3.4	4.1	1.9	0.6	1.8
5	0.5	4.5	1.0	1.6	1.5	6.9	2.6	3.3	3.6	1.7	0.8	1.5
6	0.5	4.0	1.0	1.6	1.4	6.4	2.6	3.3	3.5	1.6	1.0	1.7
7	0.7	3.7	1.0	1.6	1.4	6.0	2.4	3.2	3.4	1.4	0.9	1.6
8	0.8	3.4	1.0	1.6	1.4	6.6	2.4	3.0	4.1	1.2	1.7	1.5
9	0.9	3.2	1.0	1.6	1.4	6.3	3.0	2.9	4.0	1.2	1.2	1.3
10	0.9	3.0	*1.0	1.6	1.4	6.1	4.2	2.9	3.4	1.1	0.9	1.0
11	0.9	2.7	1.0	1.6	1.4	6.6	4.9	2.8	3.3	1.0	1.9	0.9
12	1.0	2.5	1.0	1.7	1.4	7.2	4.8	2.8	3.4	1.0	2.7	0.8
13	1.1	2.3	1.0	1.7	2.3	6.4	4.6	3.7	3.7	1.0	2.2	1.5
14	1.0	2.1	1.0	1.7	8.1	10.1	5.2	4.7	3.4	0.9	2.2	3.8
15	1.1	1.9	1.0	1.7	9.4	18.6	8.7	4.9	2.9	0.9	2.3	4.0
16	1.3	1.8	1.0	1.6	10.7	12.9	11.0	4.7	2.6	0.8	2.2	3.1
17	1.4	1.6	1.0	1.6	10.1	10.3	10.8	4.3	2.3	0.8	1.8	2.6
18	1.4	1.6	1.0	1.6	9.0	8.0	10.4	3.8	2.1	0.7	1.4	4.7
19	1.4	1.6	1.1	1.6	7.4	6.6	9.2	3.5	2.0	0.6	1.2	5.2
20	4.2	1.6	1.1	1.6	8.2	6.2	7.9	3.4	1.8	0.6	1.0	5.0
21	8.6	1.6	1.1	1.6	†17.7	6.1	7.0	5.9	1.7	0.5	0.8	7.1
22	6.2	1.5	1.2	1.6	11.3	5.9	7.0	5.8	3.3	0.41	0.7	6.4
23	4.4	1.5	1.2	1.6	8.2	5.4	6.6	7.6	6.6	0.40	0.7	5.3
24	5.1	1.6	1.2	1.6	7.3	4.8	6.2	7.8	5.3	0.41	0.6	4.5
25	9.8	1.6	1.3	1.6	6.7	4.6	5.6	6.8	4.4	0.8	0.5	3.9
26	9.6	1.5	1.3	1.6	9.9	4.6	5.1	6.2	3.6	1.1	0.45	3.6
27	8.6	1.4	1.3	1.6	13.3	4.6	4.7	7.6	3.1	1.0	‡0.36	3.6
28	8.9	1.4	1.3	1.6	10.6	4.5	4.3	7.3	2.7	0.8	0.39	3.2
29	9.8	1.4	1.4	1.6	-------	4.3	4.0	6.6	2.4	0.6	1.0	2.9
30	9.3	1.3	1.4	1.6	-------	4.0	3.9	6.3	3.6	0.8	1.4	2.6
31	8.9	-------	1.5	1.6	-------	3.6	-------	6.9	-------	0.8	0.9	-------

NOTES—*Gage heights affected by ice December 10, 1917 to February 20, 1918, and discharge estimated from climatological records. †Maximum 21.4 feet at 2:15 a. m. ‡Minimum 0.33 feet.

Daily discharge, in second-feet, of West Branch of Susquehanna River at Williamsport, Lycoming County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	4,490	1,750	3,370	2,580	7,750	24,400	18,100	4,490	15,800	8,060	4,260	4,260
2	2,770	1,750	3,580	2,770	6,850	24,400	16,700	4,260	14,900	8,380	3,580	3,800
3	2,400	1,750	3,580	3,580	6,280	20,900	18,100	4,260	14,900	7,750	2,960	4,260
4	1,750	1,750	3,580	3,580	5,730	16,200	20,400	4,020	13,200	7,140	2,770	4,020
5	1,260	1,750	4,730	3,800	5,220	12,800	18,100	3,800	11,200	6,280	2,220	3,160
6	1,200	1,750	4,730	8,700	4,980	10,400	19,500	4,020	9,690	5,730	2,060	2,770
7	1,160	1,750	4,490	11,200	4,490	9,020	26,400	5,730	10,400	4,980	2,060	2,400
8	1,150	1,750	4,260	18,100	4,020	8,060	25,400	14,500	35,100	4,260	2,060	2,580
9	1,120	1,750	3,800	14,000	4,020	6,850	21,900	14,000	24,600	4,020	13,600	2,960
10	1,090	1,750	3,580	12,300	3,800	6,560	19,000	14,000	28,500	5,220	8,700	2,960
11	1,040	1,600	3,580	11,200	3,580	9,350	17,200	14,500	23,400	7,440	5,470	2,960
12	1,020	1,600	3,370	9,020	3,580	21,400	15,400	14,500	24,900	14,900	4,490	3,370
13	‡1,020	1,600	3,160	8,380	3,580	†46,000	13,600	13,600	18,500	12,300	3,800	2,770
14	1,040	1,600	2,960	7,140	3,370	36,300	12,300	12,800	13,600	10,000	4,980	2,580
15	1,090	1,600	2,770	6,560	3,370	27,000	11,200	11,200	11,200	10,000	14,900	2,400
16	1,090	1,460	2,400	7,140	3,370	22,400	9,690	9,690	9,690	9,350	25,900	2,400
17	1,110	1,600	2,220	7,440	3,160	20,900	9,020	8,060	9,020	8,700	18,500	2,220
18	1,160	1,460	2,060	8,060	3,160	23,900	7,750	7,140	8,060	7,750	11,500	1,900
19	1,210	1,460	2,060	8,060	3,160	23,900	6,560	6,280	7,440	9,020	8,060	1,900
20	2,400	1,460	2,060	8,060	4,490	18,500	6,000	5,730	6,280	8,380	6,560	1,750
21	4,020	1,600	2,060	8,060	4,260	16,700	6,280	5,220	5,220	8,700	4,980	1,750
22	5,730	1,460	2,060	7,750	4,260	15,400	6,560	5,470	4,730	7,750	4,020	1,600
23	5,470	1,460	2,060	7,140	4,260	16,200	6,000	5,730	4,020	7,750	3,580	1,900
24	4,980	1,460	2,060	12,800	4,490	19,500	5,470	6,850	3,580	6,850	8,060	1,750
25	4,020	1,600	2,060	12,800	5,730	39,800	5,220	8,380	3,370	6,560	6,850	1,600
26	3,160	1,750	2,060	10,400	7,440	36,300	4,980	8,700	3,370	5,730	4,980	1,460
27	2,400	1,750	1,900	9,020	10,800	32,300	4,730	8,380	4,730	5,220	4,020	1,300
28	2,220	1,750	2,060	7,140	19,900	36,800	4,730	8,060	8,380	7,140	3,370	1,330
29	2,060	2,060	2,220	5,220	-------	30,200	4,730	11,200	9,020	6,000	2,960	1,300
30	2,060	2,770	2,580	4,980	-------	24,900	4,730	18,100	7,750	6,000	4,020	1,280
31	1,900	-------	2,580	6,280	-------	19,900	-------	17,200	-------	5,220	4,980	-------

NOTES—†Maximum=49,400 second-feet. ‡Minimum=1,000 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1,260	26,400	2,400	1,080	785	29,600	7,449	9,350	20,900	7,750	1,750	3,580
2	1,280	21,400	2,200	1,080	785	45,400	6,500	9,020	16,700	6,000	1,750	3,370
3	1,280	17,200	2,060	1,080	720	36,300	5,470	8,060	13,200	4,730	1,460	6,000
4	1,280	17,200	2,060	1,080	730	36,300	5,470	8,060	13,200	4,730	1,460	6,000
5	1,330	11,500	2,060	1,080	790	22,400	5,470	7,440	8,380	3,370	1,750	2,960
6	1,330	9,690	2,060	1,020	730	19,900	5,470	7,440	8,060	3,160	2,060	3,370
7	1,*00	8,700	2,660	1,020	730	18,100	4,980	7,140	7,750	2,770	1,900	3,160
8	1,750	7,750	2,060	1,020	730	20,900	4,980	6,560	10,000	2,400	3,370	2,960
9	1,900	7,140	2,060	1,020	730	19,500	6,560	6,280	9,690	2,400	2,400	2,580
10	1,900	6,560	1,750	955	785	18,500	10,400	6,280	7,750	2,220	1,900	2,060
11	1,900	5,730	1,540	955	785	20,900	13,200	6,000	7,440	2,060	3,800	1,900
12	2,060	5,220	1,400	955	840	23,900	12,800	6,000	7,750	2,060	5,730	1,750
13	2,220	4,730	1,330	955	955	19,900	11,900	8,700	8,700	2,060	4,490	1,300
14	2,060	4,260	1,260	955	5,730	39,800	14,500	12,300	7,750	1,900	4,490	9,020
15	2,220	3,800	1,200	955	7,440	115,000	31,800	13,200	6,280	1,900	4,730	9,600
16	2,580	3,580	1,200	955	8,700	59,400	45,400	12,300	5,470	1,750	4,400	6,850
17	2,770	3,160	1,200	955	8,060	41,600	44,100	10,800	4,730	1,750	3,580	5,470
18	2,770	3,160	1,200	955	6,700	28,000	41,600	9,020	4,260	1,600	2,770	12,300
19	2,770	3,160	1,200	955	4,980	20,900	34,600	8,060	4,020	1,460	2,400	14,500
20	10,400	3,160	1,200	897	26,400	19,000	27,500	7,750	3,580	1,460	2,060	13,600
21	31,200	3,160	1,260	897	†106,000	18,500	22,900	17,600	3,370	1,330	1,750	23,400
22	19,000	2,960	1,330	897	47,400	17,000	22,900	17,200	7,440	1,210	1,600	19,900
23	11,200	2,960	1,330	897	29,100	15,400	20,900	25,900	29,900	1,200	1,600	14,900
24	14,000	3,160	1,260	897	24,400	12,800	19,000	27,000	14,900	1,210	1,460	11,500
25	38,000	3,160	1,200	897	21,400	11,900	16,200	21,900	11,200	1,750	1,330	9,350
26	36,800	2,960	1,200	840	38,600	11,900	14,000	19,000	8,380	2,220	1,260	8,380
27	31,200	2,770	1,200	840	62,800	11,900	12,300	23,900	6,850	2,000	‡1,150	8,380
28	32,900	2,770	1,140	840	42,800	11,500	10,800	24,400	5,730	1,750	1,190	7,140
29	38,000	2,770	1,140	840	--------	10,800	9,690	20,900	4,980	1,460	2,000	6,280
30	35,100	2,580	1,080	840	--------	9,690	9,359	19,500	8,380	1,750	2,770	5,470
31	32,900	-------	1,080	840	--------	8,380	-------	22,400	-------	1,750	1,900	-------

NOTES—*Gage heights affected by ice December 10, 1917 to February 20, 1918 and discharge estimated from climatological records. †Maximum ††145,000 second-feet observed at 2:15 a. m, ‡Minimum 1,110 second-feet. ††Estimated.

Estimated Monthly Discharge of West Branch Susquehanna River at Williamsport, Lycoming County.
(Drainage area 5,670 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	5,730	‡1,020	2,210	0.39	0.45
November	2,770	1,460	1,690	0.30	0.34
December	4,736	1,900	2,900	0.51	0.59
January	18,100	2,580	8,170	1.44	1.66
February	19,900	3,160	5,330	0.94	0.98
March	†46,000	6,560	21,800	3.84	4.43
April	26,400	4,730	12,200	2.15	2.40
May	18,100	3,800	9,030	1.59	1.83
June	25,100	3,370	12,500	2.20	2.46
July	14,900	4,020	7,500	1.32	1.52
August	25,900	2,060	6,460	1.14	1.31
September	4,260	1,280	2,430	0.43	0.48
The year	46,000	1,020	7,710	1.36	18.45

NOTES—†Maximum=49,400 second-feet, March 13, 1917. ‡Minimum=1,000 second-feet, October 13, 1916.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	38,000	1,260	11,800	2.08	2.40
November	26,400	2,580	6,650	1.17	1.30
December	2,400		1,510	0.27	0.31
January			950	0.17	0.20
February	106,000		16,100	2.84	2.96
March	115,000	8,380	25,400	4.48	5.16
April	45,400	4,980	16,600	2.93	3.27
May	27,000	6,000	13,300	2.35	2.71
June	20,900	3,370	8,820	1.56	1.74
July	7,750	1,200	2,400	0.42	0.48
August	5,730	1,150	2,460	0.43	0.50
September	23,400	1,330	7,490	1.32	1.47
The year	115,000		9,400	1.66	22.50

NOTES—Gage heights affected by ice December 10, 1917 to February 20, 1918 and discharge estimated from climatological records. Maximum ††145,000 second-feet February 21. Minimum 1,110 second-feet August 27. ††Estimated.

SUSQUEHANNA BASIN—STATION NO. 26

WEST BRANCH SUSQUEHANNA RIVER AT LEWISBURG

DESCRIPTION OF STATION

Location.—At six span, steel, through truss, highway bridge at Market Street, Lewisburg, Union County.

Records Available.—Gage heights from September 21, 1913, to September 30, 1918. For other records on this river see West Branch Susquehanna River at Bower, Clearfield, Renovo and Williamsport; also West Branch Susquehanna River at Allenwood in the 1910-11 Report of the Water Supply Commission.

Drainage Area.—6,830 square miles.

Gage.—A staff gage, whose elevation of zero is 427.9 feet above mean sea level, is painted on the first pier from the right abutment and is read twice daily by T. E. Irland.

Channel.—The right bank is high and steep; the left is of medium height and liable to overflow, and the bed is composed of gravel.

Remarks.—This station is maintained for flood warning purposes only.

Daily Mean Gage Heights, in feet, of West Branch Susquehanna River at Lewisburg, Union County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.0	0.2	0.2	1.0	1.9	5.2	4.8	1.0	4.1	2.0	0.8	1.0
2	0.8	0.2	0.6	1.0	2.0	5.1	4.6	1.0	3.8	2.0	0.5	1.0
3	0.8	0.2	0.8	1.2	2.0	4.1	4.9	1.0	3.8	1.8	0.5	1.0
4	0.5	0.2	0.8	1.8	1.9	3.4	5.0	1.0	3.6	1.4	0.5	1.0
5	0.5	0.2	0.8	1.9	1.8	3.1	4.6	1.0	3.2	1.0	0.4	1.0
6	0.2	0.2	1.0	4.0	*1.8	2.6	5.1	1.2	2.9	1.0	0.2	0.8
7	0.2	0.2	1.0	4.0	1.8	2.4	6.0	2.6	2.4	0.9	0.2	0.8
8	0.1	0.2	1.0	4.8	1.8	2.1	6.1	3.8	5.9	0.8	0.2	1.0
9	0.0	0.2	1.0	3.9	1.8	2.2	5.6	3.8	7.9	0.8	4.9	1.0
10	0.0	0.2	1.0	3.6	1.8	2.6	5.2	3.8	6.1	0.8	3.9	1.0
11	0.0	0.2	1.0	3.4	1.8	2.9	4.6	3.9	5.5	0.9	2.6	1.0
12	0.0	0.2	1.0	2.9	1.8	4.5	4.1	3.9	5.4	3.2	1.6	0.8
13	0.0	0.2	1.0	2.5	1.8	8.1	3.8	3.5	4.5	3.2	1.2	0.8
14	0.0	0.2	1.0	2.5	1.8	†8.2	3.4	3.1	3.8	2.9	3.6	0.8
15	0.0	0.0	1.0	3.0	1.8	6.8	3.0	2.9	3.4	2.8	4.4	0.8
16	0.0	0.0	1.0	3.0	1.8	5.8	2.6	2.4	2.9	2.8	6.4	0.5
17	0.0	0.0	*1.0	2.1	1.8	5.5	2.4	2.1	2.4	2.6	5.9	0.5
18	0.0	0.0	1.0	1.5	1.9	5.5	2.1	1.4	2.1	2.4	3.9	0.4
19	0.0	0.0	1.0	1.5	2.0	5.4	1.9	0.8	1.9	2.8	2.5	0.2
20	0.5	0.0	1.0	1.5	2.0	4.6	1.9	0.8	1.6	3.2	1.9	0.2
21	2.2	0.0	1.0	1.0	2.1	4.2	2.0	0.6	1.4	3.1	1.2	0.2
22	2.6	0.0	1.0	1.0	2.4	4.1	2.0	0.5	1.1	2.8	0.9	0.2
23	1.9	0.0	1.0	1.2	2.5	4.0	2.0	0.6	1.0	2.2	0.6	0.2
24	1.2	0.0	1.0	2.8	2.6	5.0	1.9	1.9	1.0	1.6	3.6	0.2
25	1.0	0.2	1.0	3.5	3.4	7.9	1.6	2.0	1.4	1.4	2.8	0.0
26	0.9	0.2	1.0	3.2	3.5	8.1	1.5	2.2	1.2	1.1	1.8	0.0
27	0.8	0.2	1.0	3.0	3.5	7.5	1.2	2.2	1.4	1.0	1.4	0.0
28	0.6	0.2	1.0	2.5	4.2	8.8	1.4	2.0	1.5	1.0	1.1	0.0
29	0.5	0.2	1.0	1.5	-------	8.0	1.5	2.5	1.9	1.0	1.0	0.0
30	0.2	0.2	1.0	1.2	-------	6.5	1.1	2.2	2.0	0.9	1.0	-0.2
31	0.2	-------	1.0	1.6	-------	5.5	-------	3.5	-------	0.8	1.0	-------

NOTES—*River frozen December 17, 1916 to January 6, 1917, and February 6 to 26, 1917, inclusive. †Maximum 9.5 feet at 1 a. m. estimated from hydrograph.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	‡§-0.2	7.5	0.5	0.8	0.8	7.5	1.8	3.0	5.2	1.9	0.5	0.7
2	‡§-0.2	5.5	0.5	0.8	0.8	9.5	0.9	3.0	4.4	1.9	0.5	1.1
3	‡§-0.2	4.8	0.6	0.8	0.8	8.6	0.8	2.8	3.6	1.5	0.4	1.4
4	‡§-0.2	3.9	0.8	0.8	0.8	6.9	1.0	2.4	2.9	1.1	0.2	1.4
5	‡§-0.2	3.4	0.8	0.8	0.8	5.6	1.4	2.0	2.6	0.6	0.2	0.9
6	0.0	2.9	0.8	0.8	0.8	5.0	1.5	2.0	2.2	0.2	0.5	0.2
7	0.5	2.4	0.8	0.8	0.8	5.4	1.5	1.8	2.5	0.2	0.6	1.2
8	0.5	2.1	*0.8	0.8	0.8	5.4	1.5	1.4	3.0	0.2	0.8	1.0
9	‖0.5	2.0	0.8	0.8	0.8	4.9	1.6	1.2	2.9	0.2	0.8	0.8
10	‖0.6	1.9	0.8	0.8	0.8	5.1	2.9	1.0	2.2	0.2	0.6	0.6
11	‖0.6	1.8	0.8	0.8	0.8	5.9	3.5	1.0	1.9	0.1	0.5	0.4
12	‖0.7	1.8	0.8	0.8	0.8	5.9	3.6	1.1	1.9	0.0	1.4	0.4
13	0.7	1.6	0.8	0.8	0.8	5.4	3.5	1.5	2.1	0.0	1.4	0.6
14	0.1	1.5	0.8	0.8	3.4	8.0	3.9	3.6	2.5	0.0	1.2	1.8
15	0.8	1.5	0.8	0.8	7.9	†16.4	6.5	3.5	2.2	0.0	1.3	2.6
16	0.8	1.5	0.8	0.8	11.5	13.4	9.6	3.5	2.1	0.0	1.2	2.2
17	0.8	1.5	0.8	0.8	6.8	9.0	9.6	3.1	1.9	0.0	1.1	1.6
18	0.8	1.4	0.8	0.8	5.5	7.0	9.6	2.9	0.9	0.0	0.8	2.3
19	0.8	1.2	0.8	0.8	4.4	5.4	8.2	2.5	0.8	0.2	0.6	3.5
20	1.1	1.2	0.8	0.8	6.1	5.2	6.8	3.2	0.8	0.2	0.4	3.5
21	5.0	1.2	0.8	0.8	15.8	4.8	5.8	4.5	0.8	0.2	0.4	5.4
22	4.8	1.0	0.8	0.8	12.4	4.5	5.6	4.5	0.8	0.2	0.2	5.2
23	3.6	1.1	0.8	0.8	7.4	4.1	5.4	5.1	4.4	0.1	0.2	4.2
24	3.4	1.4	0.8	0.8	5.9	3.8	5.0	6.1	4.1	0.0	0.1	3.5
25	7.1	1.5	-------	0.8	5.4	3.5	4.6	5.4	3.2	0.2	0.1	2.7
26	8.1	1.2	-------	0.8	9.1	3.1	4.1	4.5	2.6	0.4	0.2	2.4
27	7.2	1.0	-------	0.8	12.8	2.9	3.6	5.1	2.0	0.5	0.2	2.5
28	6.8	0.9	0.8	0.8	9.8	2.6	3.1	5.8	1.6	0.5	0.1	2.2
29	7.5	0.8	0.8	0.8	-------	2.4	2.8	5.2	1.4	0.5	0.3	1.9
30	8.8	0.5	0.8	0.8	-------	2.1	2.9	4.8	1.1	0.5	0.8	1.6
31	9.1	-------	0.8	0.8	-------	2.0	-------	4.9	-------	0.5	0.7	-------

NOTES—*Gage heights affected by ice December 8, 1917 to February 16, 1918. ‖Interpolated. §Estimated. †Maximum 16.8 feet at 5:00 p. m. ‡Minimum §-0.2 feet.

SUSQUEHANNA BASIN—STATION NO. 27

SUSQUEHANNA RIVER AT SUNBURY

DESCRIPTION OF STATION

Location.—At P. & R. Railway Co. bridge at Sunbury, Northumberland County.

Records Available.—Gage heights from June 24, to September 30, 1918. For other records on this river see Susquehanna River at Selins Grove and Harrisburg; also Susquehanna River at McCall Ferry in 1910-11 Report of the Water Supply Commission.

Drainage Area.—18,200 square miles.

Gage.—A staff gage, whose elevation of zero is 420.00 feet above mean sea level, is painted on the downstream end of the first pier from the Sunbury shore and is read twice daily by W. E. Bayler.

Channel.—Both banks are high and subject to overflow during extreme floods and the bed is composed of rock and gravel.

Remarks.—The P. & R. Railway Co. observed gage heights at this station from August 9, 1916 to March 31, 1917.

Daily Mean Gage Heights, in feet, of Susquehanna River at Sunbury, Northumberland County, for the year ending September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1										0.5	0.4	0.6
2										2.4	0.4	1.0
3										2.2	0.3	1.0
4										1.7	0.3	1.0
5										1.5	0.3	0.7
6										1.3	0.3	1.1
7										1.2	0.2	1.6
8										1.0	0.2	1.2
9										1.0	0.2	1.1
10										1.0	0.2	0.9
11										0.8	0.2	0.8
12										1.0	0.6	0.7
13										1.1	0.8	0.7
14										1.2	1.2	1.1
15										1.5	1.5	1.8
16										1.6	1.3	1.5
17										1.5	1.3	1.1
18										1.2	1.1	1.5
19										1.0	0.8	2.1
20										0.7	0.6	2.4
21										0.5	0.4	3.5
22										0.5	0.3	4.0
23										0.5	0.3	3.7
24									2.0	0.4	0.2	3.0
25									1.6	0.5	0.2	2.6
26									1.4	0.7	0.1	2.2
27									1.1	0.6	††0.0	2.3
28									0.8	0.6	††0.0	2.8
29									0.5	0.6	††0.0	3.0
30									9.2	0.6	0.1	2.7
31										0.5	0.1	

NOTES—††Estimated.

SUSQUEHANNA RIVER AT SELINSGROVE

DESCRIPTION OF STATION

Location—At Pennsylvania Railroad Bridge between Selinsgrove Junction and Selinsgrove, Snyder County.
Records Available—Daily gage heights from March 19, 1914, to May 31, 1918. For other records on this river see Susquehanna River at Sunbury and Harrisburg; also Susquehanna River at McCall Ferry in the 1910-11 Report of the Water Supply Commission.

Drainage Area—18,500 square miles.

Gage—A gage, whose elevation of zero is 411.6 feet above mean sea level, is painted on the west side of the second pier from the right or west bank, and was read twice daily by H. E. Richter.

Channel—Both banks are high and the bed is rocky.

Remarks—Only gage heights were obtained at this station which were used for flood warning purposes only. The U. S. Weather Bureau has observed gage heights at this station since October 1, 1892.

Daily Mean Gage Heights, in feet, of Susquehanna River at Selinsgrove, Snyder County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.5	0 9	2.2	5.7	2.2	4.2	6.0	1.8	5.3	4.6	3.3	2.4
2	1.8	0.9	2.6	5.6	2.2	4.2	5.6	1.7	4.6	4.1	2.6	2.6
3	1.6	0.8	2.8	5.4	2.1	4.4	6.1	1.7	4.2	3.8	1.9	2.2
4	1.4	0.8	2.6	5.6	2.0	3.9	6.6	1.6	3.8	5.0	1.7	2.0
5	1.2	0.8	2.5	5.8	2.0	3.6	6.3	1.7	3.5	4.6	1.6	2.2
6	1.0	0.8	2.0	7.2	1.8	3.4	5.8	2.1	3.3	3.6	1.4	2.2
7	0.9	0.8	2.0	6.2	1.8	3.1	6.2	2.8	3.4	3.1	1.4	2.0
8	0.8	0.8	1.8	5.1	1.9	2.4	6.3	3.8	4.5	2.8	1.3	2.0
9	0.8	0.8	1.8	4.6	1.8	2.7	6.2	4.4	7.6	2.6	2.0	2.0
10	0.6	0.8	1.8	3.9	1.8	3.0	5.5	4.4	6.8	2.4	4.8	1.6
11	0.6	0.8	1.8	3.4	1.9	3.3	5.1	4.4	6.0	2.8	5.7	1.6
12	0.5	0.7	1.7	3.0	2.8	4.3	4.6	4.2	5.8	3.4	4.2	1.6
13	0.4	0.8	1.8	2.9	*3.4	7.0	4.3	3.8	6.0	3.5	3.0	1.6
14	0.4	0.8	1.6	3.3	3.3	6.6	4.0	3.5	5.6	3.2	3.4	1.4
15	0.4	0.8	1.5	3.8	3.6	5.6	3.7	3.2	5.1	3.2	3.8	1.2
16	‡0.3	0.7	1.5	4.0	3.6	5.2	3.4	2.9	4.7	3.0	5.7	1.1
17	0.4	0.8	1.4	3.8	3.4	5.0	3.2	2.6	4.4	3.2	5.4	1.0
18	0.6	0.8	1.4	3.5	3.2	5.0	2.9	2.5	4.0	3.0	4.2	1.0
19	0.8	0.8	1.4	3.4	3.4	5.1	2.6	2.4	3.4	3.0	3.4	0.9
20	1.4	0.8	*2.4	3.1	3.4	4.7	2.5	2.1	3.0	3.2	2.9	0.9
21	2.2	0.8	4.4	2.9	3.2	4.2	2.4	2.0	2.8	3.0	2.5	0.8
22	2.6	0.7	4.4	2.7	3.2	3.9	2.4	1.9	3.4	3.1	2.2	0.8
23	2.8	0.8	4.2	2.4	3.1	3.9	2.4	2.0	4.4	3.5	2.2	0.9
24	2.8	0.8	6.6	2.6	3.1	4.8	2.3	2.2	3.8	3.2	2.6	0.8
25	2.4	1.2	6.2	3.0	3.2	6.8	2.3	2.4	3.8	2.8	3.2	0.8
26	2.0	1.4	5.9	2.7	3.4	7.6	2.2	2.6	4.6	2.4	3.7	0.7
27	1.8	1.7	6.0	2.4	3.4	8.0	2.1	2.4	4.2	2.2	3.3	0.7
28	1.4	2.0	6.2	2.1	3.6	9.0	2.0	2.3	4.5	2.0	2.7	0.6
29	1.2	2.0	6.0	2.0	-------	†9.2	1.9	2.6	5.3	2.0	2.2	0.6
30	1.0	1.8	5.6	2.0	-------	8.4	1.8	4.1	5.0	2.0	2.0	0.6
31	1.0	-------	5.5	2.2	-------	7.2	-------	5.9	-------	2.0	2.0	-------

NOTES—*River frozen December 20, 1916 to January 8, 1917 and February 13 to 27, 1917, inclusive. †Maximum 9.3 feet at 8 a.m. ‡Minimum 0.3 feet October 16 and 17, 1916.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.6	9.0	1.1	1.5	1.9	8.4	2.6	3.4	-------	-------	-------	-------
2	0.5	7.4	1.1	1.5	1.9	10.8	2.1	3.4	-------	-------	-------	-------
3	0.5	6.6	1.1	1.5	1.9	9.0	2.5	3.4	-------	-------	-------	-------
4	0.5	5.4	1.0	1.4	1.9	7.2	2.8	3.3	-------	-------	-------	-------
5	0.5	4.6	1.2	1.4	1.9	6.2	3.0	3.2	-------	-------	-------	-------
6	0.6	4.0	1.0	1.4	1.9	5.4	3.0	3.2	-------	-------	-------	-------
7	0.7	3.5	1.1	1.3	1.9	5.4	2.9	3.1	-------	-------	-------	-------
8	0.7	3.0	1.0	1.4	1.9	5.8	2.5	2.9	-------	-------	-------	-------
9	*0.8	2.6	0.9	1.4	1.9	5.8	2.6	2.6	-------	-------	-------	-------
10	0.8	2.5	*0.9	1.4	2.2	5.8	3.2	2.3	-------	-------	-------	-------
11	0.7	2.4	0.8	1.4	2.4	6.0	4.2	2.3	-------	-------	-------	-------
12	0.8	2.3	0.8	1.7	2.4	6.4	4.6	2.2	-------	-------	-------	-------
13	1.1	2.3	0.7	1.9	2.6	5.8	4.4	2.2	-------	-------	-------	-------
14	1.0	2.2	0.9	1.9	3.8	6.8	4.7	3.1	-------	-------	-------	-------
15	1.0	2.1	1.3	1.9	6.4	13.4	6.5	4.0	-------	-------	-------	-------
16	1.2	2.0	1.4	1.9	11.0	12.7	9.0	4.9	-------	-------	-------	-------
17	1.2	1.9	1.4	1.9	8.8	8.8	10.0	4.0	-------	-------	-------	-------
18	1.1	1.8	1.4	1.9	7.5	7.0	9.5	3.2	-------	-------	-------	-------
19	1.2	1.8	1.5	1.9	6.4	6.3	8.6	3.0	-------	-------	-------	-------
20	2.0	1.6	1.5	1.9	8.9	6.1	7.4	2.8	-------	-------	-------	-------
21	4.1	1.6	1.7	1.9	14.9	6.2	6.5	2.9	-------	-------	-------	-------
22	4.9	1.5	1.8	1.9	14.7	6.4	6.4	3.8	-------	-------	-------	-------
23	3.8	1.4	1.8	1.9	12.2	6.4	6.2	4.6	-------	-------	-------	-------
24	3.6	1.4	1.9	1.9	9.0	6.0	6.0	5.2	-------	-------	-------	-------
25	5.9	1.6	2.0	1.9	8.2	5.6	5.6	4.9	-------	-------	-------	-------
26	8.2	1.6	2.0	1.9	9.0	5.1	5.1	4.2	-------	-------	-------	-------
27	7.4	1.6	1.8	1.9	11.8	4.6	4.6	4.3	-------	-------	-------	-------
28	6.6	1.6	1.8	1.9	10.4	3.8	4.2	5.0	-------	-------	-------	-------
29	7.0	1.3	1.7	1.9	-------	3.6	3.6	5.4	-------	-------	-------	-------
30	8.4	1.2	1.6	1.9	-------	3.4	3.4	5.2	-------	-------	-------	-------
31	10.2	-------	1.6	1.9	-------	3.0	-------	5.4	-------	-------	-------	-------

NOTES—Gaging station discontinued May 31, 1918. *Gage heights affected by ice December 10, 1917 to February 16, 1918.

SUSQUEHANNA BASIN—STATION NO. 29

FRANKSTOWN BRANCH JUNIATA RIVER AT WILLIAMSBURG

DESCRIPTION OF STATION

Location—At two span, steel through truss, highway bridge at Pennsylvania Railroad Station, Williamsburg, Blair County.

Records Available—Discharge measurements and gage heights from October 24, 1916, to September 30, 1918.

Drainage Area—295 square miles.

Gage—A standard chain gage, whose elevation of zero is 831.78 feet above mean sea level, is located on the upstream handrail of the bridge and is read twice daily by G. E. Henderson.

Channel—Both banks are high and only overflow in extreme stages, and the bed is composed of small boulders, mud and gravel.

Discharge Measurements of Frankstown Branch Juniata River at Williamsburg, Blair County.
(Drainage area 295 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1916		Sq. ft.	Feet	Sec.-ft.	
1	Oct. 24	Boehringer & Brown	137	1.73	102	0.6 method
	1917					
2	Mar. 24	Knight	619	5.55	1,632	0.2 and 0.8 method
3	Mar. 31	Knight	342	3.42	581	0.2 and 0.8 method
4	Apr. 12	Knight	371	3.73	646	0.2 and 0.8 method
5	Apr. 20	Knight	290	3.05	392	0.2 and 0.8 method
6	July 13	Bowen & Weaver	245	2.72	320	0.2 and 0.8 method
	1918					
7	Aug. 21	Hosmer & Lichty	111	1.57	73	0.2 and 0.8 method

Daily Mean Gage Heights, in feet, of Frankstown Branch Juniata River at Williamsburg, Blair County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916–1917												
1	-------	1.65	1.80	2.15	4.61	3.58	3.27	2.26	4.05	2.12	1.78	1.70
2	-------	1.65	1.72	2.30	5.56	3.26	3.20	2.26	3.48	2.12	1.78	1.58
3	-------	1.61	1.66	2.47	1.84	3.08	3.50	2.19	3.58	2.04	1.78	1.52
4	-------	1.59	1.67	3.25	2.64	2.91	3.07	2.16	3.23	2.00	1.72	1.58
5	-------	1.67	1.68	5.80	2.71	2.80	3.20	2.96	2.98	1.87	1.70	1.58
6	-------	1.64	1.62	4.89	2.44	2.48	5.35	3.12	3.03	1.97	1.65	1.72
7	-------	1.61	1.58	3.67	2.64	2.48	4.73	2.84	7.76	2.24	1.70	1.82
8	-------	1.59	1.58	2.27	2.60	3.11	4.60	2.92	5.45	2.16	1.75	4.45
9	-------	1.57	1.62	3.07	2.66	3.98	4.23	3.24	4.41	4.49	2.00	2.45
10	-------	1.59	1.57	3.08	2.14	3.64	3.85	3.06	4.01	3.37	1.75	2.30
11	-------	1.60	1.66	2.87	2.11	5.54	3.03	2.99	4.21	3.94	1.75	1.92
12	-------	1.57	1.62	2.09	2.02	†8.46	3.71	2.86	3.75	3.04	1.65	1.85
13	-------	1.57	1.58	2.37	2.04	5.54	3.53	2.69	3.43	2.68	1.70	1.82
14	-------	1.57	1.55	2.47	1.98	4.91	3.40	2.62	3.08	2.55	2.32	1.80
15	-------	1.57	1.63	2.12	2.06	4.46	3.33	2.59	2.98	2.35	2.08	1.82
16	-------	1.57	1.46	2.25	2.01	3.98	3.05	2.49	2.95	2.30	1.92	1.82
17	-------	1.56	1.62	2.17	2.08	4.28	2.97	2.46	2.65	2.80	2.38	1.68
18	-------	1.57	1.62	2.15	3.06	4.21	2.80	2.39	2.53	2.45	1.80	1.70
19	-------	1.55	1.58	2.09	3.08	3.81	2.77	2.29	2.43	2.40	1.80	1.65
21	-------	1.54	1.61	2.15	2.68	3.68	2.73	2.22	2.25	2.15	1.72	1.58
22	-------	1.53	1.62	5.22	2.51	3.91	2.57	2.16	2.21	2.62	1.61	1.62
23	-------	1.53	1.70	4.19	2.58	3.84	2.55	2.84	2.08	2.40	1.75	1.40
24	1.73	1.87	1.70	3.32	4.84	5.39	2.50	2.32	2.63	2.15	1.98	1.60
25	‖1.68	1.69	1.54	3.02	3.56	4.56	2.43	2.22	2.53	1.98	1.76	1.60
26	-------	1.55	1.62	2.12	2.48	3.64	3.00	2.24	2.28	2.35	1.70	1.62
26	1.64	1.39	1.62	2.79	3.34	4.21	2.57	2.16	2.13	2.20	1.75	1.55
27	1.62	1.63	1.83	2.27	4.46	4.01	2.47	2.16	2.25	2.10	1.55	1.60
28	1.63	‡1.35	3.54	2.65	4.16	4.07	2.40	2.19	2.14	2.05	1.60	1.52
29	1.61	1.67	3.30	2.52	-------	3.94	2.35	4.09	2.78	1.98	1.68	1.60
30	1.62	1.73	2.53	3.22	-------	3.61	2.27	3.62	2.33	1.88	1.90	1.62
31	1.64	-------	2.40	3.85	-------	3.39	-------	3.19	-------	1.85	1.78	-------

NOTES—†Maximum 10.00 feet at 4 a.m. estimated from hydrograph. ‡Minimum 1.34 feet at 8:10 a.m. ‖Interpolated.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917–1918												
1	1.6	2.7	1.8	1.5	1.6	4.7	2.3	2.9	3.6	1.8	1.6	1.6
2	1.6	2.8	1.7	1.5	1.6	4.4	2.3	2.7	3.2	1.7	1.6	1.7
3	1.6	2.4	1.7	1.4	1.6	4.4	2.3	2.6	2.9	1.7	1.6	1.6
4	1.6	2.8	1.6	1.4	1.6	4.0	2.3	2.6	2.7	1.7	1.8	1.6
5	1.6	2.2	1.7	1.5	1.5	4.2	2.1	2.5	2.6	1.7	3.8	1.6
6	1.6	2.2	1.8	1.7	1.6	4.2	2.1	2.5	2.4	1.7	2.3	1.8
7	1.6	2.1	1.7	1.7	1.6	4.5	2.1	2.5	2.6	1.7	1.7	1.7
8	‡1.4	2.0	1.7	1.6	1.8	4.0	2.4	2.4	2.3	1.6	1.7	1.7
9	1.6	2.0	1.7	1.6	2.0	3.6	3.9	2.3	2.2	1.7	1.9	1.6
10	1.5	2.1	1.6	1.6	2.4	4.4	3.7	2.3	2.1	1.6	2.3	1.5
11	1.6	2.0	1.6	1.6	2.9	4.4	4.2	2.3	2.2	1.8	2.3	1.5
12	1.6	2.0	1.6	1.6	4.1	4.1	4.0	2.3	2.2	1.8	2.7	1.6
13	1.6	2.0	1.6	1.6	7.7	4.1	4.0	2.6	2.1	1.8	2.6	2.1
14	1.5	1.9	1.6	1.5	6.3	5.9	5.9	2.5	2.0	1.6	1.7	1.9
15	1.5	1.9	1.6	1.6	7.2	5.3	7.8	2.3	2.0	1.6	2.2	1.8
16	1.6	1.9	1.6	1.5	5.5	4.4	7.5	2.1	2.0	1.6	1.8	1.6
17	1.6	1.8	1.6	1.6	5.0	4.1	6.8	2.1	2.0	1.6	1.7	1.7
18	1.5	1.8	1.6	1.6	3.7	3.7	6.3	2.1	2.0	1.6	1.7	1.8
19	1.7	1.8	1.6	1.6	4.2	3.4	5.1	2.0	1.9	1.6	1.6	1.7
20	2.3	1.8	1.7	1.6	8.8	3.2*	5.0	2.5	1.8	1.6	1.6	1.9
21	1.9	1.8	1.6	1.6	6.2	3.1	5.4	2.9	1.8	1.6	1.6	2.1
22	1.6	2.0	1.6	1.6	4.7	3.0	5.2	2.8	2.5	1.5	1.6	2.1
23	1.7	2.0	1.7	1.5	4.0	2.8	4.6	2.7	2.6	1.5	1.7	1.7
24	5.3	1.9	1.8	1.6	4.3	2.7	4.1	2.5	2.0	1.6	1.6	1.7
25	5.1	1.9	1.8	1.6	5.6	2.7	3.7	2.5	1.9	2.0	1.6	1.6
26	3.8	1.9	1.8	1.6	†9.4	2.6	3.5	2.7	1.9	1.7	1.5	1.6
27	3.4	1.5	1.8	1.6	6.3	2.5	3.3	2.4	1.8	1.6	1.5	1.6
28	3.9	1.6	2.0	1.6	5.2	2.5	3.2	2.4	1.8	1.6	1.5	1.6
29	3.2	1.7	1.6	*1.6	-------	2.4	3.1	2.4	2.0	1.5	1.5	1.6
30	3.0	1.8	1.5	1.6	-------	2.4	3.1	4.2	1.9	1.6	1.6	1.5
31	2.8	-------	1.6	1.6	-------	2.3	-------	5.0	-------	2.0	1.6	-------

NOTES—*Gage heights affected by ice January 29 to February 13, 1918. †Maximum 11.3 feet at 10:00 a. m. ‡Minimum 1.3 feet.

SUSQUEHANNA BASIN—STATION NO. 30

LITTLE JUNIATA RIVER AT TYRONE

DESCRIPTION OF STATION

Location—At single span, steel, highway bridge, known as Pennsylvania Avenue bridge, Tyrone, Blair County.

Records Available—Gage heights and discharge measurements from August 22 to September 30, 1918.

Drainage Area—107 square miles.

Gage—A standard chain gage, whose elevation of zero is 877.04 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by H. W. Waple.

Channel—Both banks are high and the bed is composed of rock and gravel.

Discharge Measurements of Little Juniata River at Tyrone, Blair County.
(Drainage area 107 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1918		Sq. ft.	Feet	Sec. ft.	
1	Aug. 22	Hosmer & Lichty	104	0.94	28	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Little Juniata River at Tyrone, Blair County, for the year ending September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1												2.40
2												2.00
3												1.54
4												1.40
5												1.47
6												1.46
7												1.25
8												1.22
9												1.16
10												1.09
11												1.08
12												1.85
13												2.45
14												1.78
15												1.54
16												1.50
17												2.62
18												2.20
19												1.99
20												3.36
21												2.62
22												2.30
23											1.08	2.15
24											1.05	1.94
25											1.00	1.82
26											0.96	1.80
27											0.98	1.70
28											0.98	1.63
29											2.98	1.50
30											1.56	1.48
31											2.00	

SUSQUEHANNA BASIN—STATION NO. 31

FRANKSTOWN BRANCH JUNIATA RIVER AT HUNTINGDON

DESCRIPTION OF STATION

SMITHFIELD BRIDGE

Location—At three span, steel, through truss, highway bridge known as Smithfield Bridge, Huntingdon, Huntingdon County.

Records Available—Discharge measurements and gage heights from September 29, 1915, to September 30, 1917.

Drainage Area—845 square miles.

Gage—A standard chain gage, whose elevation of zero is 599.10 feet above mean sea level, is located on the downstream side of the bridge and is read thrice daily by Lawrence White.

Channel—Both banks are high but may overflow during extreme floods, and the bed is composed of rocks and gravel, with some vegetable growth.

Remarks—The discharge measurements and gage heights may be obtained in the office of the Water Supply Commission upon request.

FOURTH STREET BRIDGE

Location—At two span, covered wagon bridge known as Fourth Street Bridge, Huntingdon, Huntingdon County.

Records Available—Gage heights have been obtained since May 1, 1895. For detailed information relative to data at this station see page 106 in the 1915 Report of the Water Supply Commission.

Drainage Area—See page 107 in the 1915 Report of the Water Supply Commission.

Gage—A staff gage, whose elevation of zero is 595.12 feet above mean sea level, is located on the downstream corner of the pier and is read thrice daily by Lawrence White.

Channel—The right bank is low and overflows during high stages; the left is high and not subject to overflow, and the bed is composed of gravel and vegetable growths.

General Remarks—All data at these stations is withheld for publication until a definite relation curve is established between the two gages and all previous published data revised, when the Fourth Street station will be abandoned and the Smithfield Bridge used as the permanent gaging station.

SUSQUEHANNA BASIN—STATION NO. 32

RAYSTOWN BRANCH JUNIATA RIVER AT SAXTON

DESCRIPTION OF STATION

Location—At two span, steel, through truss, highway bridge between Stonestown and Saxton Furnace, Bedford County.

Records Available—Discharge complete from August 31, 1911, to September 30, 1918.

Drainage Area—790 square miles.

Gage—A standard chain gage, whose elevation of zero is 789.91 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by D. R. Jenkins.

Channel—Both banks are high and only overflow in extreme stages, and the bed is composed of sand, gravel and stones.

Discharge Measurements of Raystown Branch Juniata River, at Saxton, Bedford County
(Drainage area, 790 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1916		Sq. ft.	Feet	Sec.-ft.	
27	Oct. 23	Boehringer,	382	1.94	424	0.6 method
	1917					
28	Mar. 23	Knight,	901	3.75	2,008	0.2 & 0.8 method
29	April 13	Knight,	732	3.16	1,396	0.2 & 0.8 method
30	July 12	Bowen & Weaver,	497	2.39	806	0.2 & 0.8 method
	1918					
31	Aug. 21	Hosmer & Lichty,	209	0.93	166	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Raystown Branch Juniata River at Saxton, Bedford County, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.9	1.3	1.3	2.2	4.3	3.9	2.8	1.7	3.1	1.8	1.4	1.9
2	1.6	1.3	1.3	2.4	4.4	3.4	2.6	1.7	3.2	1.6	1.3	1.6
3	1.5	1.3	1.4	2.4	4.0	3.2	2.6	1.7	2.8	1.4	1.2	1.5
4	1.4	1.3	1.3	2.5	3.4	3.0	2.6	1.7	2.6	1.4	1.2	1.4
5	1.3	1.3	1.3	3.6	2.0	2.8	2.7	1.8	2.3	1.4	1.2	1.3
6	1.2	1.3	1.2	4.7	2.4	2.4	4.2	2.0	2.6	1.3	1.1	1.3
7	1.2	1.3	1.2	4.0	2.3	2.3	4.9	1.9	7.4	1.3	1.1	1.3
8	1.2	1.3	1.2	3.5	2.4	2.8	4.4	1.8	6.7	1.3	1.1	1.8
9	1.2	1.3	1.2	3.0	2.4	4.0	4.0	1.8	5.2	1.4	1.6	3.2
10	1.2	1.3	1.3	2.8	2.4	4.0	3.9	2.0	4.2	2.0	2.0	2.4
11	1.2	1.3	1.3	2.5	2.0	4.8	3.6	2.0	4.3	2.2	1.4	2.0
12	1.1	1.3	1.3	2.3	1.9	†10.5	3.4	1.9	3.6	2.3	1.2	1.8
13	1.1	1.2	1.3	2.2	*	7.0	3.2	1.8	3.2	1.8	1.2	1.6
14	1.2	1.2	1.3	2.3	-------	5.4	3.0	1.8	2.9	1.6	1.2	1.5
15	1.2	1.2	1.3	2.1	-------	4.8	2.9	1.8	2.8	1.6	1.2	1.4
16	1.1	1.1	1.2	1.9	-------	4.5	2.7	1.7	2.5	1.6	1.6	1.4
17	1.1	1.1	1.1	1.9	-------	4.2	2.5	1.7	2.3	2.0	2.1	1.3
18	1.2	1.1	1.1	2.0	-------	4.8	2.3	1.7	2.1	1.8	2.2	1.3
19	1.5	1.1	1.1	1.9	-------	4.6	2.2	1.7	1.9	2.0	1.7	1.3
20	2.5	1.1	1.1	1.8	-------	4.1	2.1	1.6	1.8	1.9	1.4	1.3
21	2.7	1.1	1.1	1.8	-------	4.0	2.0	1.5	1.8	1.7	1.3	1.2
22	2.4	1.1	1.2	2.7	-------	4.1	2.0	1.6	1.7	1.6	1.2	1.2
23	2.0	1.1	1.2	5.5	-------	3.8	1.9	1.7	1.6	1.7	1.2	1.2
24	1.7	1.4	1.2	4.0	-------	3.8	1.9	1.7	1.8	1.9	2.0	1.1
25	1.6	1.4	1.3	3.7	4.8	4.2	2.0	1.6	2.0	1.6	2.5	1.1
26	1.5	1.2	1.3	3.2	3.8	3.9	2.0	1.5	1.9	1.6	1.8	‡1.0
27	1.5	1.2	1.4	2.4	4.0	3.6	1.9	1.5	1.7	3.0	1.6	1.0
28	1.4	1.3	1.9	2.3	4.4	3.4	1.9	1.6	1.5	2.4	1.4	1.1
29	1.3	1.3	4.3	2.2	-------	3.3	1.8	2.9	1.6	1.8	1.4	1.1
30	1.3	1.4	3.3	2.9	-------	3.2	1.7	3.5	1.9	1.5	1.6	1.1
31	1.3	-------	2.4	4.6	-------	3.0	-------	3.3	-------	1.4	2.6	-------

NOTES—*River frozen February 13 to 24, 1917, inclusive. †Maximum 10.8 feet at 12:00 p. m. ‡Minimum 1.0 feet September 26 and 27, 1917.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.1	3.0	1.1	1.5	1.3	4.6	1.7	2.7	2.8	1.6	0.9	1.4
2	1.1	2.7	1.2	1.5	1.3	4.4	1.6	2.6	2.3	1.4	0.9	1.4
3	1.1	2.3	1.2	1.5	1.4	4.1	1.7	2.4	2.1	1.3	0.9	1.4
4	1.1	2.1	1.2	1.5	1.4	3.9	1.7	2.2	1.9	1.2	0.9	1.3
5	1.1	1.9	1.2	1.5	1.4	3.7	1.7	2.1	1.8	1.0	0.9	1.0
6	1.1	1.8	1.2	1.5	1.4	3.8	1.6	2.0	1.7	1.0	0.8	1.2
7	1.0	1.6	1.2	1.5	1.5	3.8	1.6	2.0	1.6	1.0	0.9	1.2
8	1.0	1.6	*1.3	1.5	1.5	3.7	1.6	2.0	1.6	0.9	1.1	1.2
9	1.0	1.6	1.3	1.5	1.6	3.5	2.5	2.0	1.5	0.9	1.2	1.1
10	1.0	1.6	1.3	1.5	1.7	4.4	3.4	2.0	1.5	0.9	1.6	1.0
11	1.0	1.6	1.3	1.4	2.1	4.2	3.9	2.0	1.5	0.9	1.2	1.0
12	1.0	1.5	1.3	1.4	3.4	3.8	3.7	1.9	1.5	1.0	1.1	1.0
13	1.0	1.5	1.3	1.4	7.1	3.6	4.0	2.0	1.6	1.1	1.0	0.9
14	1.0	1.4	1.2	1.4	6.2	4.7	4.7	2.5	1.6	1.1	1.1	1.0
15	1.0	1.4	1.2	1.4	5.6	4.8	8.2	2.7	1.4	1.0	1.4	1.0
16	1.0	1.3	1.2	1.4	5.0	4.5	7.9	2.5	1.4	1.0	1.2	1.0
17	1.0	1.3	1.2	1.4	4.6	3.9	7.5	2.2	1.4	1.0	1.2	1.1
18	1.0	1.3	1.2	1.4	3.9	3.4	7.0	2.1	1.3	1.0	1.0	1.2
19	1.0	1.3	1.2	1.4	3.7	3.0	6.1	1.9	1.2	0.9	1.0	1.3
20	1.4	1.3	1.3	1.4	8.1	2.8	5.1	2.1	1.2	0.9	1.0	1.6
21	1.9	1.3	1.4	1.4	6.8	2.6	5.4	2.1	1.1	1.0	0.9	1.5
22	1.4	1.3	1.4	1.4	5.6	2.5	5.1	2.0	1.4	1.0	0.9	1.5
23	1.3	1.4	1.4	1.4	4.0	2.4	4.9	2.1	1.5	0.9	‡0.8	1.4
24	3.0	1.3	1.5	1.4	3.8	2.2	4.6	2.1	1.5	0.9	‡0.8	1.2
25	5.7	1.3	1.7	1.4	4.7	2.1	4.0	1.9	1.4	1.0	‡0.8	1.2
26	4.3	1.2	1.7	1.4	†10.3	2.0	3.6	1.9	1.3	1.2	0.8	1.1
27	3.6	1.2	1.8	1.4	8.1	2.0	3.2	2.0	1.2	1.0	0.9	1.0
28	3.4	1.1	1.8	1.4	5.5	1.9	3.0	2.0	1.1	0.9	0.9	1.0
29	3.3	1.1	1.7	1.3	-------	1.8	2.8	1.8	1.2	0.9	‡0.8	1.0
30	3.4	1.1	1.6	1.3	-------	1.8	2.7	3.2	1.5	1.0	‡0.8	0.9
31	3.9	-------	1.6	1.3	-------	1.7	-------	3.5	-------	1.0	1.0	-------

NOTES—*Gage heights affected by ice December 8, 1917 to February 13, 1918. †Maximum 10.8 at 2:00 p. m. ‡Minimum 0.8 feet.

Daily Discharge, in second-feet, of Raystown Branch Juniata River at Saxton, Bedford County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	442	223	223	620	3,100	2,510	1,150	356	1,480	398	256	442
2	316	223	223	775	3,260	1,840	950	356	1,600	316	223	316
3	280	223	250	775	2,650	1,600	950	356	1,150	250	200	280
4	250	223	223	866	1,840	1,260	950	356	950	250	206	250
5	223	223	223	2,160	494	1,150	1,050	398	695	250	206	223
6	200	223	200	3,760	775	775	2,950	494	950	223	181	223
7	200	223	200	2,650	695	695	4,100	442	9,190	223	181	223
8	200	223	200	1,970	775	1,150	3,260	398	7,650	223	181	398
9	200	223	200	1,360	775	2,650	2,650	398	4,640	250	216	1,600
10	200	223	223	1,150	775	2,650	2,510	494	2,950	494	494	775
11	200	223	223	866	494	3,930	2,100	494	3,100	620	250	494
12	181	223	223	695	442	†17,500	1,840	442	2,100	695	206	398
13	181	200	223	620	*398	8,300	1,600	398	1,600	398	206	316
14	200	200	223	695	356	5,020	1,360	398	1,260	316	200	280
15	200	200	223	559	316	3,930	1,260	398	1,150	316	200	250
16	181	181	200	242	316	3,420	1,050	356	860	316	316	250
17	181	181	181	442	280	2,950	860	356	695	494	552	223
18	200	181	181	494	316	3,930	695	356	552	398	620	223
19	280	181	181	442	280	3,590	620	356	442	494	356	223
20	860	181	181	398	280	2,800	552	316	398	442	250	223
21	1,050	181	181	398	250	2,650	494	280	398	356	223	200
22	775	181	200	1,050	223	2,800	494	326	356	316	200	200
23	494	181	200	5,210	250	2,370	442	356	316	356	200	200
24	350	250	200	2,650	1,480	2,370	442	356	398	442	494	181
25	316	250	223	2,230	3,930	2,950	494	316	494	316	860	181
26	280	200	223	1,600	2,370	2,510	494	280	442	316	398	‡164
27	280	200	250	775	2,650	2,100	442	280	356	1,360	316	164
28	250	223	442	695	3,260	1,840	442	316	280	775	250	181
29	223	223	3,100	695	-------	1,720	398	1,260	316	398	250	181
30	223	250	1,720	1,260	-------	1,600	356	1,970	442	280	316	181
31	223	-------	775	3,590	-------	1,360	-------	1,720	-------	250	950	-------

NOTES—*River frozen February 13 to 24, 1917, inclusive, and discharge estimated from climatological data. †Maximum = 18,500 second-feet. ‡Minimum = 164 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	181	1,360	181	157	157	3,590	356	1,050	1,150	316	150	250
2	181	1,050	200	150	144	3,260	316	950	695	250	150	250
3	181	695	200	150	130	2,800	356	775	552	223	150	250
4	181	552	200	150	139	2,510	356	620	442	200	150	223
5	181	442	200	150	134	2,230	356	552	398	164	150	164
6	181	398	200	150	130	2,370	316	494	256	164	150	200
7	164	316	200	150	130	2,370	316	494	316	164	150	200
8	164	316	*181	144	139	2,230	316	494	316	150	181	200
9	164	316	172	144	150	1,970	860	494	280	150	200	181
10	164	316	164	144	181	3,260	1,840	494	280	150	316	164
11	164	316	164	139	226	2,950	2,510	494	280	150	200	164
12	164	280	164	139	468	2,370	2,230	442	280	164	181	164
13	164	280	164	139	2,300	2,100	2,650	494	316	181	164	176
14	164	250	164	139	6,660	3,760	3,760	809	316	181	181	164
15	164	250	164	139	5,400	3,920	11,100	1,050	250	164	250	164
16	164	223	157	139	4,980	3,420	10,400	860	250	164	200	164
17	164	223	157	139	3,590	2,510	9,420	620	950	164	200	181
18	164	223	157	139	2,510	1,840	8,300	552	223	164	164	200
19	164	223	157	139	2,230	1,360	6,400	442	200	150	164	223
20	250	223	150	139	10,800	1,150	4,460	552	206	150	164	316
21	442	223	150	139	7,800	950	5,020	552	181	164	150	280
22	250	223	157	139	5,400	860	4,460	494	250	164	150	280
23	223	250	164	134	2,650	775	4,100	552	280	150	‡139	250
24	1,360	223	181	134	2,370	620	3,590	552	280	150	‡139	200
25	5,600	223	190	134	3,760	552	2,650	442	250	164	‡139	200
26	3,100	200	200	134	†16,900	494	2,100	442	223	200	‡139	181
27	2,100	200	211	130	10,800	494	1,600	494	200	164	150	164
28	1,840	181	200	130	5,210	442	1,360	494	181	150	150	164
29	1,720	181	190	130	-------	398	1,150	398	200	150	‡139	164
30	1,840	181	172	130	-------	398	1,050	1,600	280	164	‡139	150
31	2,510	-------	157	130	-------	356	-------	1,970	-------	164	164	-------

NOTES—*Gage heights affected by ice December 8, 1917 to February 13, 1918 and discharge estimated from climatological records. †Maximum 18,500 second-feet from hydrograph at 2:00 p. m. ‡Minimum 139 second-feet.

Estimated Monthly Discharge of Raystown Branch Juniata River at Saxton, Bedford County
(Drainage area, 790 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	1,050	181	311	0.39	0.45
November	250	181	211	0.27	0.30
December	3,100	181	378	0.48	0.55
January	5,210	398	1,350	1.71	1.97
February	3,930	----------	1,180	1.49	1.55
March	†17,500	695	3,100	3.92	4.52
April	4,100	356	1,230	1.56	1.74
May	1,970	280	496	0.63	0.73
June	9,190	280	1,570	1.99	2.22
July	1,260	223	404	0.51	0.59
August	950	181	323	0.41	0.47
September	1,600	‡164	315	0.40	0.45
The year	17,500	164	904	1.14	15.54

NOTES—River frozen February 13 to 24, 1917, inclusive, and discharge estimated from climatological data. †Maximum=18,500 second-feet, March 12, 1917. ‡Minimum=464 second-feet, September 26 and 27, 1917.

	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	5,600	164	789	1.00	1.15
November	1,360	181	345	0.44	0.49
December	----------	----------	176	0.22	0.25
January	----------	----------	140	0.18	0.21
February	16,900	----------	3,390	4.29	4.47
March	3,930	356	1,880	2.38	2.74
April	11,100	316	3,120	3.95	4.41
May	1,970	298	670	0.85	0.98
June	1,150	181	322	0.41	0.46
July	316	150	172	0.22	0.25
August	316	139	168	0.21	0.24
September	316	150	200	0.25	0.28
The year	16,900	139	927	1.17	15.93

NOTES—Gage heights affected by ice December 8, 1917, to February 13, 1918, and discharge estimated from climatological records. Maximum 18,500 second-feet February 26. Minimum 139 second-feet August 23 to 26 and 29 and 30.

SUSQUEHANNA BASIN—STATION NO. 33

TUSCARORA CREEK NEAR PORT ROYAL

DESCRIPTION OF STATION

Location—At single span, steel, through truss, highway bridge about two miles above Port Royal, Juniata County.

Records Available—Discharge complete from August 21, 1911, to September 30, 1917; discharge measurements and gage heights from October 1, 1917, to September 30, 1918.

Drainage Area—205 square miles.

Gage—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge and is read twice daily by G. W. Groninger.

Channel—Both banks are low but not subject to overflown except during extreme stages, and the bed is composed of gravel and rocks.

Discharge Measurements of Tuscarora Creek near Port Royal, Juniata County
(Drainage area, 205 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1916		Sq. ft.	Feet	Sec.-ft.	
17	Oct. 2	Boehringer & Bowen	127	2.88	113	0.6 method
	1917					
18	Feb. 19	Boehringer, Bowen & Reckord	228	4.99	278	Under ice cover
19	Feb. 23	Bowen & Reckord	176	4.47	178	Under ice cover
20	July 11	Bowen & Weaver	283	4.59	651	0.2 & 0.8 method
	1918					
21	Aug. 20	Hosmer & Liebty	101	2.48	65	0.2 & 0.8 method
22	Sept. 27	Reckord & Klugh	131	2.99	135	0.2 & 0.8 & 0.6 method

Daily Mean Gage Heights, in feet, of Tuscarora Creek near Port Royal, Juniata County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	††3.10	2.53	2.46	-------	-------	3.9	3.4	2.80	2.81	2.42	2.24	2.23
2	2.80	2.56	2.39	-------	-------	3.6	3.4	2.79	2.83	2.43	2.30	2.20
3	2.60	2.46	2.32	-------	-------	3.4	3.5	2.71	2.94	2.40	2.22	2.50
4	2.64	2.50	2.40	-------	-------	3.4	3.28	2.77	2.77	2.24	2.22	2.32
5	2.56	2.48	2.35	-------	-------	3.23	3.4	3.03	2.71	2.30	2.19	2.24
6	2.50	2.45	2.35	4.9	-------	3.06	6.3	3.22	2.86	2.33	2.28	2.23
7	2.51	2.46	2.28	3.6	-------	3.05	5.4	2.93	3.4	2.20	2.19	2.38
8	2.46	2.50	2.28	3.4	-------	3.5	4.5	3.01	3.7	2.12	2.34	3.9
9	2.48	2.39	2.36	3.23	-------	4.7	4.2	3.02	3.3	2.64	3.04	3.3
10	2.40	2.42	2.37	3.16	-------	4.2	3.9	2.93	3.09	2.90	2.94	2.86
11	2.39	2.40	2.40	3.07	-------	4.8	3.7	2.90	3.14	4.5	2.60	2.70
12	2.35	2.46	2.48	*	-------	†7.9	3.5	2.91	2.94	4.2	2.38	2.46
13	2.41	2.45	2.35	-------	-------	5.6	3.5	2.85	2.88	3.4	2 39	2.39
14	2.46	2.44	*	-------	-------	5.0	3.3	2.85	2.84	2.96	2.30	2.27
15	2.32	2.44	-------	-------	-------	5.0	3.24	2.77	2.72	2.82	2.30	3.04
16	2.92	2.41	-------	-------	-------	4.6	3.22	2.68	2.89	2.79	2.36	3.22
17	2.40	2.40	-------	-------	-------	4.9	3.08	2.69	2.75	2.90	2.32	2.79
18	2.38	2.32	-------	-------	-------	5.1	3.05	2.72	2.69	2.96	2.18	2.56
19	3.05	2.31	-------	-------	-------	4.4	3.03	2.63	2.60	3.3	2.13	2.58
20	3.9	2.34	-------	-------	-------	4.2	3.5	2.65	2.58	3.18	2.20	2.43
21	3.5	2.36	-------	-------	-------	3.9	3.14	2.60	2.51	2.79	2.17	2.46
22	3.10	2.34	-------	-------	-------	4.1	3.12	2.51	2.46	2.64	2.22	2.34
23	2.96	2.34	-------	-------	-------	3.8	3.00	2.97	2.44	2.86	2.19	2.36
24	2.82	2.56	-------	-------	-------	4.5	3.02	2.90	3.09	2.80	2.32	2.34
25	2.71	2.69	-------	-------	-------	4.2	2.94	2.71	2.74	2.65	2.29	2.26
26	2.60	2.22	-------	-------	-------	4.0	2.93	2.57	2.50	2.52	2.28	2.32
27	2.59	2.52	-------	-------	-------	3.9	2.92	2.63	2.52	2.50	2.20	2.24
28	2.58	2.41	-------	-------	4.6	3.9	2.91	2.67	2.49	2.54	2.12	2.32
29	2.58	2.44	-------	-------	-------	3.7	2.86	2.95	2.48	2.36	2.24	2.36
30	2.52	2.38	-------	-------	-------	3.6	2.77	2.97	2.48	2.38	2.50	‡1.98
31	2.57	-------	-------	-------	-------	3.5	-------	2.70	-------	2.34	2.44	-------

NOTES—*Creek frozen December 14, 1916, to January 5, 1917, and January 12, to February 27, 1917, inclusive. †Maximum 8.8 feet at 9 a. m. estimated from hydrograph. ‡Minimum 1.96 feet at 7:30 a. m. ††Estimated.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.20	4.2	2.51	2.91	3.5	5.0	2.86	3.6	2.71	2.43	2.55	3.4
2	2.29	3.7	2.39	2.82	3.5	4.8	2.84	3.5	2.58	2.32	2.38	2.95
3	2.22	3.4	2.46	2.85	3.5	4.5	2.88	3.29	2.49	2.14	2.14	2.69
4	2.20	3.25	2.33	2.91	3.5	4.3	3.08	3.28	2.39	2.22	2.18	2.60
5	2.23	3.06	2.31	2.97	3.4	4.4	2.80	3.4	2.35	2.14	5.2	2.62
6	2.21	2.96	2.34	2.88	3.4	4.3	2.77	3.3	2.47	2.02	3.5	4.9
7	2.16	2.96	2.35	3.07	3.5	4.4	2.64	3.09	2.80	2.09	2.80	3.4
8	2.29	2.92	*2.39	3.07	3.5	4.1	2.74	3.03	2.52	2.06	3.05	3.00
9	2.26	2.80	2.38	3.13	3.6	4.0	3.6	3.01	2.43	2.22	2.78	2.82
10	2.16	2.84	2.57	3.07	3.6	4.7	4.5	2.89	2.43	2.08	2.98	2.75
11	2.22	2.73	2.49	3.09	3.8	4.1	5.7	2.96	2.45	2.18	3.5	2.56
12	2.18	2.64	2.51	3.3	4.1	4.1	5.2	2.83	2.44	2.20	2.94	2.76
13	2.19	2.68	2.49	3.4	6.2	4.0	4.9	3.03	2.56	2.12	2.81	3.5
14	2.28	2.65	2.53	3.4	9.3	5.3	6.6	3.16	2.39	2.13	2.76	3.29
15	2.36	2.62	2.67	3.6	7.9	4.7	8.4	3.03	2.31	2.16	3.3	2.87
16	2.32	2.52	2.69	3.5	8.2	4.2	8.6	2.84	2.33	2.15	3.04	2.76
17	2.10	2.58	2.82	3.4	6.8	3.9	7.7	2.79	2.37	2.04	2.62	2.93
18	2.14	2.48	2.76	3.4	5.6	3.8	6.8	2.71	2.36	‡2.02	2.48	3.6
19	2.30	2.44	2.71	3.4	5.6	3.7	5.6	2.67	2.25	2.10	2.48	4.4
20	2.80	2.40	2.79	3.15	8.8	3.5	5.0	2.69	2.21	2.06	2.42	4.1
21	2.63	2.51	2.81	3.29	6.5	3.4	5.7	2.81	2.24	2.01	2.50	4.7
22	2.47	2.59	2.75	3.4	5.0	3.4	6.6	2.75	2.78	2.05	2.50	5.9
23	2.47	2.79	2.81	3.29	4.5	3.28	5.4	3.11	2.77	2.07	2.49	3.4
24	6.0	2.76	3.13	3.25	4.4	3.08	5.0	2.69	2.48	2.11	2.43	3.14
25	6.9	2.42	3.07	3.3	5.9	3.24	4.5	2.86	2.35	2.57	2.32	3.06
26	4.3	2.52	3.3	3.3	†10.4	3.17	4.2	2.87	2.29	2.72	2.24	2.90
27	3.7	2.62	3.5	3.27	6.4	3.03	4.0	2.73	2.32	2.26	2.21	2.94
28	3.5	2.42	3.4	3.5	5.4	2.96	3.8	2.75	2.31	2.16	2.27	2.76
29	3.22	2.45	3.17	3.5	-------	2.92	3.7	2.66	2.18	2.15	3.6	2.62
30	6.8	2.44	2.94	3.5	-------	3.00	3.9	2.69	2.17	2.08	3.02	2.59
31	5.4	-------	3.01	3.6	-------	2.90	-------	2.77	-------	3.4	2.62	-------

NOTES—*Gage heights affected by ice December 8, 1917, to February 20, 1918, and discharge estimated from climatological records. †Maximum 11.4 feet at 11:00 a. m. ‡Minimum 1.92 feet.

Daily Discharge, in second-feet, of Tuscarora Creek near Port Royal, Juniata County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	160	61	52	57	560	385	230	160	102	47	25	24
2	100	65	46	57	615	285	230	98	106	48	52	20
3	70	52	34	57	315	230	255	86	128	44	22	57
4	76	57	44	85	315	230	200	96	96	25	22	54
5	65	54	38	255	550	188	230	146	86	32	19	25
6	57	50	38	890	515	152	1,870	185	112	36	30	24
7	58	52	36	285	255	150	1,210	126	230	20	19	42
8	52	57	36	230	230	255	670	142	315	12	37	385
9	54	43	39	188	230	780	510	144	205	76	148	265
10	44	47	46	172	180	510	385	126	158	120	128	112
11	43	44	44	154	160	835	315	120	168	670	70	85
12	58	52	54	*100	120	†3,350	255	122	128	510	42	52
13	45	50	38	85	85	1,340	255	110	116	230	43	43
14	52	49	*20	85	70	950	205	110	108	132	32	28
15	34	49	20	70	70	950	190	96	88	104	32	148
16	124	49	20	70	70	725	185	82	118	98	39	185
17	44	44	20	70	70	890	156	84	92	120	34	98
18	42	34	10	70	160	1,020	150	88	84	132	18	65
19	150	33	10	70	285	615	146	74	70	205	13	67
20	385	37	10	70	230	510	255	78	67	176	31	48
21	255	39	10	70	180	385	168	70	58	98	17	52
22	160	37	16	120	180	465	164	58	52	76	22	37
23	132	37	20	950	180	350	140	134	49	112	19	39
24	104	65	32	670	315	670	144	120	158	160	34	37
25	86	84	32	510	615	510	128	86	91	78	31	27
26	70	22	20	425	510	425	126	66	57	60	30	24
27	69	60	20	385	425	385	124	74	60	57	31	25
28	67	45	44	385	725	585	122	80	56	62	12	34
29	67	49	140	385	-------	315	112	130	54	39	25	39
30	60	42	70	385	-------	285	96	134	54	42	57	‡3
31	66	-------	57	425	-------	255	-------	85	-------	37	49	-------

NOTES—*Creek frozen December 14, 1916 to January 5, 1917, and January 12 to February 27, 1917, inclusive, and discharge estimated from two current meter measurements, together with climatological data. †Maximum=4,340 second-feet. ‡Minimum=2 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	20	510	58	32	57	950	112	285	86	48	64	230
2	31	315	43	32	63	835	108	255	67	34	42	130
3	22	230	52	26	57	670	116	202	56	14	14	84
4	20	192	36	26	57	560	156	200	43	22	18	70
5	24	152	33	26	57	615	190	230	38	14	1,080	73
6	21	132	37	26	57	560	96	205	53	4	255	890
7	16	132	38	32	57	615	76	158	100	9	100	230
8	31	124	*32	32	63	465	91	146	60	7	150	140
9	27	100	32	32	70	425	285	142	48	22	97	104
10	16	108	32	38	77	780	670	118	48	9	136	92
11	22	90	32	44	92	465	1,420	132	50	18	255	65
12	18	76	26	50	130	465	1,080	106	49	20	128	94
13	19	82	26	57	510	425	890	146	65	12	102	255
14	30	78	26	69	1,280	1,140	2,120	172	43	13	94	202
15	39	73	26	70	1,140	780	3,880	146	33	16	205	114
16	34	60	26	70	835	510	4,110	108	36	15	148	94
17	16	67	26	63	510	385	3,150	98	40	6	73	126
18	14	54	26	57	332	350	2,300	96	34	‡4	54	285
19	32	49	26	57	367	315	1,340	80	26	10	54	615
20	100	44	32	50	1,140	255	950	84	21	7	47	465
21	74	58	32	44	2,040	230	1,420	102	25	4	44	780
22	53	69	32	44	950	230	2,120	92	97	6	44	385
23	53	98	32	44	670	200	1,210	162	96	8	56	230
24	1,640	94	32	44	615	156	950	84	54	11	48	168
25	2,400	47	44	44	1,560	190	670	112	38	66	34	152
26	560	60	57	44	6,480	174	510	114	31	88	25	120
27	315	73	63	50	1,950	146	425	90	34	27	21	128
28	255	47	57	57	1,210	132	350	92	33	16	28	94
29	185	50	44	57	-------	124	315	79	18	15	285	73
30	2,300	49	38	57	-------	140	385	84	17	9	144	69
31	1,210	-------	32	50	-------	120	-------	96	-------	230	73	-------

NOTES—*Gage heights affected by ice December 8, 1917, to February 20, 1918, and discharge estimated from climatological records. †Maximum ††8,080 second-feet from hydrograph at 11.00 a. m. ‡Minimum ††2 second-feet. ††Estimated.

Estimated Monthly Discharge of Tuscarora Creek near Port Royal, Juniata County
(Drainage area, 205 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	385	38	91	0.44	0.51
November	84	22	49	0.24	0.27
December	----------	----------	35	0.17	0.20
January	----------	----------	253	1.23	1.42
February	----------	----------	279	1.36	1.42
March	†3,350	150	606	2.96	3.41
April	1,870	96	308	1.50	1.67
May	185	58	105	0.51	0.59
June	315	49	109	0.53	0.59
July	670	12	116	0.57	0.66
August	148	12	38	0.19	0.22
September	385	‡3	69	0.34	0.38
The year	3,350	3	171	0.83	11.34

NOTES—Creek frozen December 14, 1916 to January 5, 1917, and January 12 to February 27, 1917, inclusive, and discharge estimated from two current meter measurements, together with climatological data. †Maximum=4,340 second-feet, March 12, 1917. ‡Minimum=2 second-feet, September 30, 1917.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	2,400	10	309	1.51	1.74
November	510	44	110	0.54	0.60
December	----------	----------	36	0.18	0.21
January	----------	----------	46	0.22	0.25
February	††6,480	----------	801	3.91	4.07
March	1,140	120	432	2.11	2.43
April	4,110	76	1,047	5.11	5.70
May	285	79	136	0.66	0.76
June	100	17	48	0.23	0.26
July	230	4	25	0.12	0.14
August,	1,080	14	126	0.61	0.70
September	780	65	219	1.07	1.19
The year	††6,480	4	273	1.33	18.05

NOTES—Gage heights affected by ice December 8, 1917, to February 20, 1918, and discharge estimated from climatological records. Maximum ††8,080 second-feet February 26. Minimum ††2 second-feet July 18. ††Estimated.

SUSQUEHANNA BASIN—STATION NO. 34

JUNIATA RIVER AT NEWPORT

DESCRIPTION OF STATION

Location—At four span, steel, through truss, highway bridge 806 feet east of Public Square at Newport, Perry County.

Records Available—Discharge complete from March 21, 1899, to July 14, 1906, and from January 7, 1907, to September 30, 1918.

Drainage Area—3,380 square miles.

Gage—A standard chain gage, whose elevation of zero is 363.32 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by A. R. Bortel.

Channel—Both banks are high and not subject to overflow, and the bed is composed of hard material.

Discharge Measurements of Juniata River at Newport, Perry County
(Drainage area, 3,380 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
54	Feb. 27	Bowen & Reckord	2,582	6.30	10,415	Surf. & 0.6 method
55	Mar. 12	Reckord	5,316	10.69	26,677	Surface method
56	Mar. 13	Reckord	7,008	13.57	37,909	Surface method
57	Mar. 14	Reckord	4,744	9.90	22,412	Surface method
58	Mar. 14	Reckord	4,492	9.47	20,995	Surface method
59	Mar. 15	Reckord	3,705	8.23	16,967	Surface method
60	Mar. 16	Reckord	3,174	7.29	13,694	Surface method
61	April 17	Bowen & Weaver	1,596	4.49	4,208	0.6 method
62	May 16	Bowen & Weaver	1,326	3.98	2,711	0.2 & 0.8 method
63	July 9	Bowen & Weaver	1,166	3.68	2,050	0.6 method
64	July 10	Bowen & Weaver	2,068	5.44	6,720	0.2 & 0.8 method
	1918					
65	Jan. 21	Reckord	835	4.46	1,003	Under ice cover

Daily Mean Gage Heights, in feet, of Juniata River at Newport, Perry County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	4.2	3.30	3.25	-------	5.2	6.5	5.1	3.8	4.6	4.0	3.6	3.5
2	3.7	3.34	3.5	-------	6.0	5.7	4.9	3.9	4.1	3.7	3.4	3.4
3	3.35	3.20	3.15	-------	5.4	5.3	5.0	3.8	4.8	3.6	3.4	3.6
4	3.6	3.22	3.12	-------	4.6	4.9	4.9	3.7	4.7	3.6	3.4	3.4
5	3.29	3.20	3.16	-------	4.0	4.8	4.7	3.8	4.5	3.5	3.4	3.28
6	3.31	3.25	3.10	-------	3.9	4.6	6.3	3.9	4.5	3.4	3.4	3.4
7	3.30	3.24	3.18	7.1	4.2	4.4	8.1	4.3	4.7	3.4	3.25	3.18
8	3.11	3.34	3.25	5.9	4.2	4.4	7.8	4.1	7.3	3.5	3.25	4.2
9	3.19	3.34	3.35	5.2	4.3	5.2	6.8	4.2	7.8	3.7	4.0	4.4
10	3.17	3.39	3.35	4.8	*	6.4	6.4	4.2	6.2	5.4	3.7	4.3
11	2.99	3.22	3.10	4.5	-------	6.5	5.9	4.2	5.8	6.4	3.6	4.2
12	3.11	3.32	3.5	4.2	-------	10.0	5.5	4.2	6.0	6.5	3.5	3.8
13	3.19	3.30	3.18	4.0	-------	†13.4	5.3	4.1	5.4	5.8	3.4	3.7
14	3.19	3.30	‡2.84	4.2	-------	9.7	5.0	4.1	5.1	4.9	3.18	3.6
15	3.13	2.95	3.18	4.2	-------	8.4	4.7	4.0	4.7	4.5	3.5	3.5
16	3.10	3.34	*	4.3	-------	7.4	4.5	4.0	4.6	4.2	3.8	3.6
17	3.11	3.4	-------	4.0	-------	7.1	4.5	3.9	4.4	4.2	3.4	3.5
18	3.01	3.4	-------	3.7	-------	7.6	4.4	3.8	4.3	4.2	3.4	3.4
19	3.4	3.24	-------	3.8	-------	7.4	4.3	3.8	4.1	4.2	3.4	3.33
20	3.8	3.24	-------	3.8	-------	6.4	4.4	3.8	4.0	4.4	3.33	3.33
21	4.2	3.13	-------	3.8	-------	6.0	4.4	3.8	3.8	4.1	3.31	3.25
22	4.0	2.84	-------	4.3	-------	6.0	4.2	3.6	3.7	3.9	3.4	3.13
23	5.9	3.06	-------	4.3	-------	6.0	4.6	3.7	3.7	3.8	3.33	3.17
24	3.8	3.20	-------	6.0	-------	6.4	4.0	3.8	3.8	3.7	3.6	3.18
25	3.7	3.14	-------	5.6	-------	7.0	4.0	3.9	3.8	3.6	3.4	3.05
26	3.6	3.22	-------	5.1	-------	6.7	4.0	3.7	3.8	3.6	3.31	2.93
27	3.5	3.18	-------	4.5	6.3	6.3	4.0	3.7	3.8	3.7	3.31	3.21
28	3.37	3.32	-------	4.2	7.3	6.2	4.0	3.6	3.7	4.2	3.4	3.18
29	3.34	3.02	-------	4.1	-------	6.0	3.9	3.7	3.7	4.0	3.4	3.18
30	3.29	3.4	-------	4.1	-------	5.6	4.0	4.1	3.9	3.8	3.7	3.18
31	3.23	-------	-------	4.4	-------	5.4	-------	4.6	-------	3.6	3.6	-------

NOTES—*River frozen December 16, 1916, to January 6, 1917, and February 10 to 26, 1917, inclusive. †Maximum 13.7 feet at 7:30 a. m. ‡Minimum 2.84 feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	3.23	6.0	3.19	4.1	4.6	8.9	3.9	5.2	5.5	3.34	3.23	3.5
2	3.21	5.3	3.5	4.1	4.5	7.8	3.8	4.9	5.0	3.39	3.18	3.4
3	2.94	4.8	3.39	4.2	4.4	7.3	3.9	4.8	4.5	3.4	3.08	3.5
4	3.21	4.5	3.19	4.2	4.5	6.8	4.0	4.6	4.3	3.34	2.98	3.33
5	3.21	4.4	3.29	4.1	4.5	6.5	3.9	4.5	4.1	3.14	3.13	3.13
6	3.23	4.2	3.36	4.2	4.5	6.5	3.8	4.5	4.0	3.07	5.6	3.7
7	3.18	4.0	3.33	4.2	4.5	6.7	3.7	4.4	4.1	3.09	4.2	3.9
8	3.18	3.9	3.39	4.2	4.5	6.6	3.7	4.3	3.9	3.04	3.5	3.6
9	3.15	3.9	2.99	4.2	4.5	6.2	3.9	4.2	3.9	3.04	3.18	3.28
10	3.67	3.8	*3.22	4.1	4.7	6.3	5.1	4.1	3.8	3.09	3.5	3.23
11	3.25	3.8	3.34	4.2	4.6	7.2	6.8	4.1	3.6	3.09	3.7	3.18
12	3.15	3.7	3.9	4.2	4.8	6.6	7.4	4.0	3.7	3.09	3.6	3.08
13	3.13	3.5	4.2	4.3	6.2	6.2	7.0	4.0	3.6	3.29	3.5	3.08
14	3.03	3.7	4.5	4.3	12.5	7.5	7.8	4.0	3.7	3.14	3.7	2.98
15	3.08	3.7	4.3	4.3	10.8	9.1	11.9	4.3	3.7	3.19	3.4	3.18
16	3.13	3.6	3.8	4.3	9.8	8.2	14.0	4.3	3.6	3.14	3.7	3.28
17	3.01	3.6	3.7	4.5	8.8	7.0	13.1	4.1	3.6	2.99	3.33	3.28
18	3.11	3.6	3.7	4.6	7.0	6.3	11.7	4.0	3.36	3.09	††3.3	3.5
19	3.08	3.6	3.7	4.6	5.9	5.9	10.2	3.9	3.4	3.04	††3.2	4.0
20	3.33	3.39	3.8	4.5	9.1	6.3	8.4	3.9	3.5	3.04	††3.2	4.3
21	3.4	3.5	4.2	4.5	13.5	5.1	7.7	3.9	3.4	2.99	††3.1	4.6
22	3.6	3.6	4.2	4.4	10.7	4.8	9.8	4.7	4.2	3.09	3.08	4.4
23	3.27	3.5	4.2	4.4	7.7	4.8	10.2	5.2	4.0	2.99	3.23	4.1
24	5.2	3.6	3.9	4.4	6.6	4.7	8.2	4.5	3.8	2.94	3.18	3.7
25	8.6	3.5	3.9	4.5	7.6	4.5	7.1	4.6	3.5	3.14	3.08	3.8
26	8.4	3.4	4.0	4.5	13.6	4.4	6.3	4.5	3.6	3.4	3.03	3.8
27	6.6	3.19	4.1	4.4	†16.0	4.4	5.8	5.0	3.5	3.29	3.03	3.6
28	5.6	3.34	4.4	4.4	11.2	4.2	5.5	4.9	3.31	3.14	‡2.98	3.5
29	5.2	3.39	4.4	4.5	-------	4.2	5.2	4.6	3.31	3.11	3.38	3.33
30	8.4	3.29	4.0	4.5	-------	4.0	5.3	4.4	3.5	3.09	3.38	3.28
31	6.9	-------	4.1	4.5	-------	3.9	-------	4.7	-------	3.6	3.33	-------

NOTES—††Estimated. *Gage heights affected by ice December 10, 1917, to February 14, 1918, †Maximum 16.7 feet at 6:00 a. m. ‡Minimum 2.88 feet.

Daily Discharge, in second-feet, of Juniata River at Newport, Perry County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1916-1917												
1	3,570	1,390	1,300	1,160	6,560	10,700	6,250	2,460	4,740	3,000	1,980	1,760
2	2,220	1,460	1,760	875	9,050	8,100	5,640	2,730	3,280	2,220	1,570	1,570
3	1,480	1,220	1,140	875	7,170	6,860	5,950	2,460	5,340	1,980	1,570	1,980
4	1,980	1,250	1,090	1,160	4,740	5,640	5,640	2,220	5,040	1,980	1,570	1,570
5	1,370	1,320	1,160	1,910	3,000	5,340	5,040	2,460	4,450	1,760	1,570	1,360
6	1,410	1,300	1,060	4,830	2,730	4,740	10,600	2,730	4,450	1,570	1,570	1,570
7	1,390	1,290	1,190	12,700	3,570	4,150	16,100	3,860	5,040	1,570	1,300	1,190
8	1,080	1,460	1,300	8,730	3,570	4,150	15,100	3,280	13,400	1,760	1,360	3,570
9	1,200	1,460	1,480	6,560	3,860	6,560	11,700	3,570	15,100	2,220	3,000	4,150
10	1,170	1,550	1,480	5,340	*2,900	10,300	10,300	3,570	9,690	7,170	2,220	3,860
11	890	1,250	1,060	4,450	2,630	10,700	8,730	3,570	8,420	10,300	1,980	3,570
12	1,080	1,430	1,760	3,570	2,630	23,400	7,480	3,570	9,050	10,700	1,760	2,460
13	1,200	1,390	1,190	3,000	2,380	†38,000	6,860	3,280	7,170	8,420	1,570	2,220
14	1,200	1,390	‡692	3,570	2,380	22,200	5,950	3,280	6,250	5,640	1,190	1,980
15	1,110	840	1,190	3,570	2,380	17,200	5,040	3,000	5,040	4,450	1,760	1,760
16	1,060	1,460	*565	3,860	2,140	13,700	4,450	3,000	4,740	3,570	2,460	1,980
17	1,080	1,570	420	3,000	2,140	12,700	4,450	2,730	4,150	3,570	1,570	1,760
18	995	1,570	420	2,220	2,380	14,400	4,150	2,460	3,860	3,570	1,570	1,570
19	1,670	1,200	420	2,460	3,170	13,700	3,860	2,460	3,280	3,570	1,570	1,440
20	2,460	1,200	420	2,460	4,550	10,300	4,150	2,460	3,000	4,150	1,440	1,440
21	3,570	1,110	420	2,460	3,990	9,050	4,150	2,460	2,460	3,280	1,410	1,300
22	3,000	692	420	3,860	3,440	9,050	3,570	1,980	2,220	2,730	1,570	1,110
23	8,730	1,000	655	3,860	2,900	9,050	4,740	2,220	2,220	2,460	1,440	1,170
24	2,460	1,220	1,010	9,050	3,440	10,300	3,000	2,460	2,460	2,220	1,980	1,190
25	2,220	1,120	655	7,790	4,830	12,300	3,000	2,730	2,460	1,980	1,570	985
26	1,980	1,250	490	6,250	6,700	11,300	3,000	2,220	2,460	1,980	1,416	812
27	1,700	1,100	490	5,450	10,000	10,000	3,000	2,220	2,460	2,220	1,410	1,240
28	1,520	1,430	490	3,570	13,400	9,690	3,000	1,980	2,220	3,570	1,570	1,190
29	1,460	940	490	3,280	-------	9,050	2,730	2,220	2,220	3,000	1,570	1,190
30	1,370	1,570	760	3,280	-------	7,790	3,000	3,280	2,730	2,460	2,220	1,190
31	1,270	-------	1,320	4,150	-------	7,170	-------	4,740	-------	1,980	1,980	-------

NOTES—*River frozen December 16, 1916 to January 6, 1917, and February 10 to 26, 1917, inclusive, and discharge estimated from climatological data. †Maximum=39,400 second-feet. ‡Minimum=692 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1917-1918												
1	1,270	9,050	1,200	770	910	19,100	2,730	6,560	7,480	1,460	1,270	1,760
2	1,240	6,860	1,760	770	840	15,100	2,460	5,640	5,950	1,550	1,190	1,570
3	826	5,340	1,550	770	840	13,400	2,730	5,340	4,450	1,570	1,030	1,760
4	1,240	4,450	1,200	705	840	11,700	3,000	4,740	3,860	1,460	882	1,440
5	1,240	4,150	1,370	705	840	10,700	2,730	4,450	3,280	1,120	1,110	1,110
6	1,270	3,570	1,500	705	910	10,700	2,460	4,450	3,000	1,026	7,790	2,220
7	1,190	3,000	1,440	705	910	11,300	2,220	4,150	3,280	1,040	3,570	2,730
8	1,190	2,730	1,550	705	985	11,000	2,220	3,860	2,730	970	1,760	1,980
9	1,140	2,730	890	705	985	9,690	2,730	3,570	2,730	970	1,190	1,530
10	1,020	2,460	*640	705	1,060	10,000	6,250	3,280	2,460	1,040	1,760	1,270
11	1,300	2,460	580	705	1,140	13,000	11,700	3,280	1,980	1,040	2,220	1,190
12	1,140	2,220	520	705	1,220	11,000	13,700	3,000	2,220	1,040	1,980	1,030
13	1,110	1,760	520	705	1,980	9,690	12,300	3,000	1,980	1,370	1,760	1,030
14	955	2,220	520	705	7,790	14,000	15,100	3,000	2,220	1,120	2,220	882
15	1,030	2,220	465	705	26,700	19,900	31,400	3,860	2,220	1,200	1,570	1,190
16	1,110	1,980	465	770	22,600	16,500	40,700	3,860	1,980	1,120	2,220	1,360
17	995	1,980	465	840	18,700	12,300	36,700	3,280	1,980	896	1,440	1,360
18	1,080	1,980	465	1,060	12,300	10,000	30,500	3,000	1,500	1,040	1,300	1,760
19	1,030	1,980	465	1,060	8,730	8,730	24,200	2,730	1,570	970	1,920	3,000
20	1,440	1,550	520	1,060	19,900	10,000	17,200	2,730	1,760	970	1,220	3,860
21	1,570	1,760	810	1,000	38,400	6,250	14,700	2,730	1,570	896	1,080	4,740
22	1,980	1,980	910	985	26,200	5,340	22,600	5,040	3,570	1,040	1,030	4,150
23	1,240	1,760	840	910	14,700	5,340	24,200	6,560	3,000	896	1,270	3,280
24	6,560	1,980	640	910	11,000	5,040	16,450	4,450	2,460	896	1,190	2,220
25	18,000	1,760	640	910	14,400	4,450	12,700	4,740	1,760	1,120	1,030	2,460
26	17,200	1,570	640	910	38,900	4,150	10,000	4,450	1,980	1,570	955	2,460
27	11,000	1,200	595	985	150,500	4,150	8,420	5,950	1,760	1,370	955	1,980
28	7,790	1,460	840	1,060	28,400	3,570	7,480	5,640	1,410	1,120	‡882	1,760
29	6,560	1,550	910	1,000	-------	3,570	6,560	4,740	1,410	1,080	1,530	1,440
30	17,200	1,370	910	985	-------	3,000	6,860	4,150	1,760	1,040	1,530	1,360
31	12,000	-------	840	910	-------	2,730	-------	5,040	-------	1,980	1,440	-------

NOTES—*Gage heights affected by ice December 10, 1917, to February 14, 1918, and discharge estimated from one discharge measurement under ice cover together with climatological records. †Maximum 54,100 second-feet from hydrograph at 6:00 a. m. ‡Minimum 744 second-feet.

Estimated Monthly Discharge of Juniata River at Newport, Perry County
(Drainage area, 3,380 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	8,730	896	1,900	0.56	0.65
November	1,570	692	1,290	0.38	0.42
December	1,760	‡	913	0.27	0.31
January	12,700		4,140	1.22	1.41
February	13,400		4,380	1.30	1.35
March	†38,000	4,150	11,200	3.31	3.82
April	16,100	2,730	6,000	1.78	1.99
May	4,740	1,980	2,830	0.84	0.97
June	15,100	2,220	4,980	1.47	1.64
July	10,700	1,570	3,580	1.06	1.22
August	3,000	1,190	1,700	0.50	0.58
September	4,150	812	1,800	0.53	0.59
The year	38,000	692	3,720	1.10	14.95

NOTES—River frozen December 16, 1916 to January 6, 1917, and February 10 to 26, 1917, inclusive, and discharge estimated from climatological data. †Maximum=39,400 second-feet, March 13, 1917. ‡Minimum=692 second-feet, December 14, 1916.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	18,000	826	4,000	1.18	1.36
November	9,050	1,200	2,700	0.80	0.89
December	1,760		865	0.26	0.30
January			845	0.25	0.29
February	50,500		12,600	3.73	3.88
March	19,900	2,730	9,530	2.82	3.25
April	40,700	2,220	13,100	3.88	4.33
May	6,560	2,730	4,230	1.25	1.44
June	7,480	1,410	2,640	0.78	0.87
July	1,980	826	1,160	0.34	0.39
August	7,790	882	1,670	0.49	0.56
September	4,740	882	2,000	0.59	0.66
The year	50,500	826	4,520	1.34	18.13

NOTES—Gage heights affected by ice December 10, 1917, to February 14, 1918, and discharge estimated from one discharge measurement under ice cover together with climatological records. Maximum 54,100 second-feet February 27. Minimum 744 second-feet August 28.

SUSQUEHANNA BASIN—STATION NO. 35

CONODOGUINET CREEK AT BRYSONS BRIDGE, CUMBERLAND COUNTY

DESCRIPTION OF STATION

Location—At two span, wooden covered, highway bridge, 500 feet below Spangler's Mill, near Hogestown, Cumberland County.

Records Available—Discharge complete from September 26, 1911, to September 30, 1917; discharge measurements and gage heights from October 1, 1917, to September 30, 1918.

Drainage Area—460 square miles.

Gage—A sectional chain gage, whose elevation of zero is arbitrary, is located on the downstream side of the bridge, and is read twice daily by Robert D. Hoy.

Channel—The right bank is fairly high, while the left bank is low, but all water passes under the bridge except at extreme stages. The bed is composed of rocks, gravel and sand.

Remarks—Silver Spring Creek enters about 500 feet above the bridge.

Estimated Monthly Discharge of Conodoguinet Creek at Brysons Bridge, Cumberland County
(Drainage area, 460 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1916		Sq. ft.	Feet	Sec.-ft.	
33	Nov. 9	Boehringer & Reckord	319	2.78	224	Wading measurement.
	1917					
34	Feb. 20	Bowen & Reckord	436	4.06	458	Under partial ice cover.
35	Mar. 23	Bowen & Weaver	597	4.22	999	0.2 & 0.8 method.
36	April 19	Bowen & Weaver	376	3.19	440	0.6 method.
37	June 28	Boehringer & Bowen	227	2.74	184	0.6 method. Wading.
38	Aug. 10	Reckord & Shade	665	4.64	998	0.2 & 0.8 method.
39	Aug. 22	Bowen & Reckord	282	2.75	170	0.2 & 0.8 method. Wading.
40	Aug. 24	Bowen & Reckord	332	3.68	281	0.2 & 0.8 method.
41	Sept. 8	Reckord & Wilson	1324	7.38	3469	Surface method.
42	Sept. 9	Reckord & Wilson	928	5.68	1847	0.2 & 0.8 method.
43	Sept. 10	Reckord & Wilson	675	4.58	979	0.2 & 0.8 method.
44	Sept. 11	Reckord & Wilson	548	4.08	681	0.2 & 0.8 method.
45	Sept. 12	Reckord & Wilson	473	3.72	542	0.2 & 0.8 method.
46	Dec. 27	Boehringer, Reckord & Taylor	288	3.28	333	Under partial ice cover.
	1918					
47	July 30	Reckord & Shade	354	3.07	398	Partly wading measurement.

Daily Mean Gage Heights, in feet, of Conodoguinet Creek at Brysons Bridge, Cumberland County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	3.4	2.96	2.89	-------	5.5	3.9	3.8	2.96	2.78	2.70	2.62	3.6
2	3.3	2.96	2.86	-------	*	3.7	3.8	2.96	2.88	2.68	2.72	4.6
3	3.06	2.79	2.74	-------	-------	3.6	3.7	2.91	3.00	2.62	2.78	4.1
4	3.04	2.74	2.66	-------	-------	3.5	3.6	2.86	2.82	2.60	2.90	3.5
5	3.02	2.86	2.79	-------	-------	3.4	3.4	2.96	2.75	2.58	2.68	3.3
6	2.92	2.84	2.69	-------	-------	3.9	5.0	3.13	2.82	2.62	2.75	3.25
7	2.92	2.80	2.69	4.4	-------	3.4	5.3	3.13	3.02	2.55	2.88	3.6
8	2.82	2.72	2.64	3.8	-------	3.4	4.6	3.01	3.8	2.62	2.65	6.9
9	2.82	2.78	2.59	3.7	-------	5.0	4.3	2.99	3.3	2.84	4.1	5.7
10	2.94	2.76	2.64	3.08	-------	5.4	4.1	3.01	3.22	3.4	4.7	4.8
11	2.99	2.94	2.76	2.93	-------	5.6	3.8	2.93	3.6	3.6	3.8	4.0
12	2.96	2.69	2.84	*	-------	7.1	3.7	3.03	3.7	4.2	3.4	3.6
13	2.79	2.76	2.84	-------	-------	6.5	3.6	3.03	3.4	4.0	3.10	3.4
14	2.86	2.79	‡2.49	-------	-------	5.5	3.5	2.93	3.15	3.8	3.02	3.3
15	2.86	2.66	2.54	†8.4	-------	5.8	3.4	2.79	3.05	3.4	2.98	3.5
16	2.74	2.79	*	8.0	-------	5.1	3.2	2.93	3.12	3.20	3.9	3.8
17	2.84	2.64	-------	6.6	-------	5.0	3.3	2.93	2.98	4.3	3.6	3.4
18	2.82	2.79	-------	*	-------	5.5	3.17	2.99	2.82	4.0	3.3	3.3
19	3.6	2.66	-------	-------	-------	4.8	3.16	2.89	2.79	3.6	2.95	3.12
20	4.0	2.62	-------	-------	-------	4.5	3.12	2.89	2.85	3.3	3.05	3.05
21	4.2	2.74	-------	-------	-------	4.4	3.27	2.73	2.95	3.12	‖2.91	3.02
22	3.7	2.66	-------	-------	-------	4.5	3.17	2.81	2.82	3.00	2.77	3.12
23	3.3	2.72	-------	-------	-------	4.2	3.04	2.83	2.78	2.95	3.00	2.90
24	3.22	2.96	-------	-------	-------	4.8	2.97	2.86	3.12	3.05	3.12	2.90
25	3.16	2.99	-------	-------	4.9	4.8	3.10	2.91	2.92	2.88	2.88	2,92
26	3.09	2.86	-------	-------	4.0	4.4	3.04	2.89	2.78	2.82	2,85	2.92
27	3.04	2.74	-------	-------	3.9	4.3	3.08	2.86	2.75	2.88	2.68	2.92
28	3.02	2.66	-------	-------	4.4	4.5	2.90	2.93	2.74	2.82	2.75	3.00
29	3.02	2.84	-------	-------	-------	4.2	3.07	2.93	2.80	2.78	2.60	2.92
30	2.84	2.82	-------	5.4	-------	4.1	3.07	2.93	2.78	2.80	4.6	2.75
31	2.96	-------	-------	6.1	-------	3.9	-------	2.89	-------	2.80	4.0	-------

NOTES—*Creek frozen December 16, 1916, to January 6, 1917; January 12 to 14; January 18 to 20 and February 2 to 24, 1917, inclusive. †Maximum 9.8 feet at 7 p. m. estimated from hydrograph. ‡Minimum 2.39 feet at 7:20 a. m. ‖Interpolated.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.82	5.7	2.92	3.28	3.6	6.4	2.98	4.0	3.00	2.85	2.58	2.88
2	2.82	4.8	2.88	3.20	3.6	5.4	3.00	3.7	2.98	2.72	2.60	3.02
3	2.62	4.2	2.82	3.28	3.7	5.4	2.95	3.6	2.88	2.72	2.58	2.92
4	2.60	4.1	2.78	3.22	3.6	5.0	3.12	3.4	2.75	2.70	2.90	2.72
5	2.62	3.8	2.72	3.20	3.6	4.5	2.92	3.5	2.85	2.68	2.70	2.72
6	2.70	3.7	2.75	3.22	3.7	5.0	2.92	3.4	3.6	2.68	3.8	2.62
7	2.80	5.6	2.72	3.26	5.8	4.9	2.98	3.3	3.4	2.52	3.3	2.68
8	2.58	5.4	*2.98	3.6	5.7	4.6	2.82	3.3	3.02	2.98	2.72	2.62
9	2.75	5.3	3.22	5.28	5.8	4.4	3.3	3.28	2.82	2.50	‡2.40	2.78
10	2.62	3.26	3.00	3.3	5.8	4.7	5.0	3.22	2.90	2.42	3.00	2.68
11	2.62	3.4	2.95	3.28	3.9	4.4	7.4	3.28	2.90	2.55	6.8	2.68
12	2.60	3.22	3.12	3.5	4.0	4.2	6.2	3.16	3.02	2.98	4.2	2.60
13	2.68	3.20	3.00	3.6	4.3	4.1	5.6	3.12	3.02	2.50	3.8	2.70
14	2.80	3.20	3.08	3.4	6.5	4.9	7.2	3.4	2.88	2.62	3.6	2.68
15	2.62	3.12	3.18	3.6	7.2	4.9	7.8	3.08	2.82	2.60	3.4	2.68
16	2.80	3.08	3.22	3.6	7.2	4.4	6.8	3.08	2.72	2.58	3.18	2.62
17	2.52	3.12	3.20	3.6	6.8	4.0	6.2	3.00	2.85	2.52	2.95	2.68
18	2.52	2.95	3.28	3.5	5.9	3.9	5.8	3.10	2.75	2.62	2.75	3.6
19	2.65	2.90	3.25	3.5	5.6	3.6	5.2	3.05	2.68	‡2.42	2.85	4.0
20	3.00	2.88	3.20	3.4	5.8	5.6	4.7	2.95	2.70	2.48	2.82	3.9
21	2.92	2.92	3.22	3.5	11.5	3.5	5.2	3.05	2.65	2.48	2.85	4.0
22	2.80	3.02	3.18	3.6	8.0	3.5	6.5	3.10	2.85	2.52	2.80	4.2
23	2.75	2.98	3.15	3.6	6.3	3.4	5.4	3.18	3.05	2.45	2.75	3.8
24	5.6	3.05	3.18	3.6	6.1	3.3	4.8	3.22	3.00	2.50	2.78	3.4
25	6.9	2.92	3.22	3.6	6.7	3.20	4.4	3.12	2.80	2.70	2.75	3.22
26	5.4	2.90	3.25	3.6	†10.4	3.3	4.2	3.02	2.72	2.68	2.72	3.02
27	4.5	2.85	3.28	3.6	8.8	3.18	4.0	3.00	2.70	2.62	2.70	3.05
28	4.6	2.78	3.3	3.7	6.6	3.10	3.9	3.22	2.72	2.58	2.72	3.00
29	4.2	2.88	3.08	3.6	-------	3.08	3.6	2.92	2.65	2.52	2.85	2.75
30	7.4	2.85	3.12	3.6	-------	3.05	4.0	2.85	2.68	2.88	2.68	2.70
31	8.1	-------	3.12	3.6	-------	3.02	-------	2.98	-------	2.58	2.80	-------

NOTES—*Gage heights affected by ice December 8, 1917, to February 21, 1918. †Maximum 10.8 feet at 4:00 p. m. ‡Minimum 2.35 feet.

Daily Discharge, in second-feet, of Conodoguinet Creek at Brysons Bridge, Cumberland County, for the year ending September 30, 1917

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	406	244	267	312	1,950	772	710	283	186	162	139	489
2	367	244	255	312	*1,710	652	710	296	218	156	168	1,020
3	278	189	210	312	1,320	396	652	275	257	139	186	728
4	271	174	181	396	1,040	542	596	255	198	133	224	447
5	264	211	228	596	772	491	491	296	177	127	156	367
6	231	205	192	1,180	710	772	1,550	366	198	139	177	348
7	231	221	192	1,160	710	491	1,790	366	264	119	218	489
8	198	168	175	710	652	491	1,250	316	578	139	148	2,960
9	198	186	158	652	596	1,550	1,040	508	367	198	728	1,840
10	237	180	175	845	542	1,870	902	316	337	406	1,080	1,140
11	254	237	217	283	491	2,040	710	283	489	489	578	676
12	244	159	248	*512	442	3,470	652	324	532	781	406	489
13	180	180	248	353	442	2,860	596	324	406	676	292	406
14	211	180	‡127	710	442	1,950	542	283	310	578	264	367
15	211	150	142	†4,970	442	2,220	491	228	274	406	250	447
16	174	138	*130	4,490	442	1,630	396	283	299	329	626	578
17	205	145	130	2,960	442	1,570	442	283	250	836	489	406
18	198	189	130	*1,550	442	1,956	383	308	198	676	367	367
19	489	150	130	1,480	596	1,400	379	267	162	489	240	299
20	676	139	130	1,460	442	1,180	362	267	208	367	274	274
21	781	174	130	968	442	1,100	428	206	240	299	227	264
22	532	150	150	1,250	442	1,180	383	236	198	257	183	299
23	367	168	178	1,950	491	968	528	244	183	240	257	224
24	337	244	232	1,710	1,180	1,400	300	255	299	274	299	224
25	314	274	212	1,400	1,480	1,400	353	275	231	218	218	231
26	289	211	178	968	836	1,100	328	267	186	198	208	231
27	271	174	146	710	772	1,040	345	255	177	218	156	231
28	264	150	130	710	1,100	1,180	271	283	174	198	177	257
29	264	205	652	1,040	-------	968	341	283	192	186	133	231
30	205	198	542	1,870	-------	902	341	289	184	192	1,020	177
31	244	-------	396	2,490	-------	772	-------	267	-------	192	676	-------

NOTES—*Creek frozen December 16, 1916 to January 6, 1917; January 12 to 14; January 18 to 29 and February 2 to 24, 1917, inclusive, and discharge estimated from one current meter measurement, together with climatological data. †Maximum=6,900 second-feet. ‡Minimum=97 second-feet.

Estimated Monthly Discharge of Conodoguinet Creek at Brysons Bridge, Cumberland County
(Drainage area, 460 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	781	189	575	0.82	0.94
November	254	139	189	0.41	0.46
December	----------	‡---	213	0.46	0.53
January	†4,970	283	1,270	2.76	3.18
February	1,950	----------	763	1.66	1.73
March	3,470	491	1,310	2.85	3.29
April	1,790	271	602	1.31	1.46
May	376	206	283	0.62	0.72
June	578	162	266	0.58	0.65
July	836	119	317	0.69	0.80
August	1,080	133	341	0.74	0.85
September	2,960	177	550	1.20	1.34
The year	4,970	----------	540	1.17	15.95

NOTES—Creek frozen December 16, 1916 to January 6, 1917; January 12-14; January 18 to 29 and Feburuary 2, to 24, 1917, inclusive, and discharge estimated from one current meter measurement, together with climatological data. †Maximum=6,900 second-feet, January 15, 1917. ‡Minimum=97 second-feet, December 14, 1916.

SUSQUEHANNA RIVER AT HARRISBURG

DESCRIPTION OF STATION

Location—At 15 span, steel, through truss, highway bridge at Walnut Street, Harrisburg, Dauphin County.

Records Available—Discharge complete from January 1, 1891, to September 30, 1918. For other records on this river see Susquehanna River at Sunbury and Selinsgrove; also Susquehanna River at McCall Ferry in the 1910-11 Report of the Water Supply Commission.

Drainage Area—24,100 square miles.

Gage—A standard chain gage, whose elevation of zero is 289.4 feet above mean sea level, is located on the upstream side of the bridge and is read twice daily by employes of the Water Supply Commission.

Channel—Both banks are high and not subject to overflow, and the bed is composed of gravel and boulders.

Remarks—During 1913, 1914, 1915 and 1916 a 4.5 foot dam 4,200 feet below the bridge was under construction which has caused backwater at the gage. The dam was finally completed on August 29, 1916.

Discharge Measurements of Susquehanna River at Harrisburg, Dauphin County
(Drainage area, 24,100 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1916		Sq. ft.	Feet	Sec.-ft.	
83	Oct. 9	Boehringer & Bowen	12,760	3.51	8,139	0.6 method
	1917					
84	Mar .20	Bowen, Knight, Weaver & Warlow	21,388	6.68	64,223	0.2 & 0.8 method
85	Mar. 21	Bowen, Knight, Weaver & Warlow	19,911	6.22	54,061	0.2 & 0.8 method
86	Mar. 26	Bowen & Weaver	28,243	9.46	124,708	0.6 method
87	Mar. 27	Bowen & Weaver	28,923	9.68	131,060	0.6 method
88	Mar. 29	Boehringer, Bowen, Weaver & Brown	31,641	10.72	152,504	0.6 method
89	Mar. 30	Boehringer, Bowen, Weaver & Brown	29,699	10.14	137,522	0.6 method
90	Mar. 31	Bochringer, Bowen, Weaver & Brown	27,137	8.98	111,381	0.6 method
91	April 5	Reckord, Knight, Brown & Osman	23,712	7.68	87,871	Surface method
92	April 16	Bowen & Weaver	17,776	5.48	38,432	0.6 method
93	April 20	Bowen, Wilson, Weaver & Osman	16,077	4.88	27,990	0.2 & 0.8 method
94	April 27	Record, Knight, Weaver & Osman	15,310	4.50	19,875	0.2 & 0.8 method
95	Aug. 7	Reckord, Knight, Heagy & Osman	13,623	3.90	12,160	0.2 & 0.8 method
96	Sept 24	Reckord & Wilson	12,591	3.56	7,610	0.2 & 0.8 method
97	Oct. 31	Reckord, Shade, Brown and McLaughlin	37,511	12.90	200,533	Surface method
	1918					
98	Jan. 17	Reckord, Shade, Knight and Lichty	10,573	4.16	6,881	Under ice cover
99	Jan. 22	Reckord, Knight, Shade and Lichty	10,542	4.20	6,891	Under ice cover
100	Mar. 16	Boehringer, Reckord, Shade, Lichty & Shannon	44,648	15.58	283,943	Surface method
101	Aug. 26	Boehringer, Reckord, Shade & Lichty	11,993	3.29	4,690	West channel 0.2 & 0.8 East channel 0.6 method
102	Aug. 29	Boehringer, Reckord, Shade & Lichty	11,785	3.25	4,071	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Susquehanna River at Harrisburg, Dauphin County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	4.0	3.70	4.1	4.5	8.9	8.8	7.7	4.3	6.8	5.9	4.3	4.4
2	4.2	3.60	4.3	4.7	9.1	10.0	7.0	4.3	6.2	5.7	4.7	4.7
3	4.2	3.66	4.5	4.6	8.4	10.8	6.9	4.2	5.9	5.5	4.3	4.8
4	4.1	3.64	4.7	4.6	7.5	10.5	7.5	4.2	5.6	5.7	4.1	4.5
5	3.97	3.64	4.6	4.7	7.3	11.5	7.7	4.2	5.6	6.2	3.98	4.4
6	3.80	3.68	4.5	5.1	7.1	10.5	7.5	4.3	5.3	5.6	3.93	4.5
7	3.72	3.69	4.3	7.4	6.5	10.3	8.0	4.5	5.2	5.2	3.90	4.3
8	3.62	3.68	4.2	7.2	6.4	10.4	8.0	5.0	5.4	4.9	3.84	4.4
9	3.51	3.66	4.2	6.7	6.8	10.1	7.8	5.8	8.2	4.7	4.1	4.7
10	3.46	3.66	4.2	6.3	7.2	8.7	7.5	5.8	8.3	4.7	5.5	4.6
11	3.42	3.67	4.1	5.7	6.7	8.3	6.8	5.9	7.5	5.0	7.1	4.2
12	3.36	3.65	4.1	5.3	6.5	7.8	6.4	5.8	7.2	5.4	6.2	4.4
13	3.36	3.66	4.0	5.2	6.6	9.7	6.0	5.6	7.3	5.7	5.3	4.3
14	3.33	3.64	4.1	5.0	6.5	10.2	5.7	5.3	6.9	5.4	4.8	4.1
15	3.35	3.62	4.1	5.4	6.4	8.4	5.6	5.1	6.5	5.2	5.2	4.1
16	3.36	3.65	*4.3	5.9	6.4	7.5	5.5	4.9	6.2	5.2	5.6	3.98
17	3.36	3.68	3.58	5.7	6.3	7.0	5.3	4.8	5.9	5.1	6.9	3.87
18	‡3.30	3.61	3.86	5.3	6.2	7.1	5.1	4.6	5.7	5.2	6.0	3.80
19	3.52	3.70	3.83	5.2	6.2	7.0	5.0	4.5	5.4	5.0	5.6	3.72
20	3.80	3.76	3.80	5.2	6.6	6.7	4.9	4.5	5.2	5.1	5.0	3.68
21	3.99	3.70	3.88	4.9	6.8	6.2	4.9	4.4	5.0	5.0	4.7	3.64
22	4.7	3.64	3.86	4.8	6.6	6.0	4.8	4.3	5.0	5.2	4.4	3.60
23	4.6	3.60	4.1	5.0	6.5	5.9	4.7	4.3	5.5	5.1	4.3	3.57
24	4.8	3.69	4.3	5.4	6.6	6.1	4.7	4.3	5.7	5.3	4.6	3.56
25	4.7	3.68	4.7	6.4	7.5	7.1	4.7	4.4	5.3	5.0	4.8	3.61
26	4.4	3.78	4.6	7.4	8.3	9.4	4.6	4.5	5.4	4.8	5.0	3.56
27	4.2	3.87	4.5	8.7	7.9	9.7	4.5	4.6	5.7	4.6	5.3	3.59
28	4.0	4.2	4.6	8.3	7.6	10.2	4.4	4.6	5.5	4.4	4.8	3.50
29	3.94	4.3	4.7	7.9	-------	†10.7	4.4	4.5	5.9	4.4	4.5	3.47
30	3.83	4.2	4.7	7.8	-------	10.1	4.3	4.6	6.4	4.5	4.5	3.45
31	3.76	-------	4.6	8.1	-------	9.0	-------	6.5	-------	4.4	4.3	-------

NOTES—*River frozen December 16, 1916 to March 13, 1917, †Maximum 10.8 at 9.00 a. m. ‡Minimum 3.30 feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	3.41	11.3	3.90	4.0	3.85	10.1	5.0	5.7	7.3	4.1	3.54	3.46
2	3.40	9.8	3.88	4.1	3.86	9.6	4.8	5.6	6.8	4.3	3.47	3.52
3	3.39	8.4	3.98	4.0	3.86	11.8	4.8	5.5	6.0	4.2	3.42	3.70
4	3.38	7.4	3.98	3.77	3.78	9.5	4.8	5.4	5.5	4.1	3.38	3.62
5	3.39	6.4	3.88	3.80	3.76	8.3	4.8	5.4	5.1	4.0	3.41	3.76
6	3.40	5.9	4.0	3.86	3.89	7.5	4.9	5.3	4.9	3.97	3.62	3.62
7	3.41	5.6	3.98	3.90	3.84	7.2	5.1	5.1	4.8	3.89	3.70	3.82
8	3.47	5.3	3.98	3.86	3.74	7.4	4.9	5.1	4.7	3.83	3.56	3.96
9	3.50	5.1	*4.5	3.86	3.73	7.5	4.8	4.9	4.7	3.77	3.46	3.76
10	3.53	5.0	4.1	3.80	3.79	7.3	5.2	4.8	4.8	3.71	3.65	3.66
11	3.58	4.8	3.85	3.82	3.80	7.6	6.1	4.7	4.9	3.67	3.54	3.54
12	3.58	4.7	3.64	3.98	3.90	7.7	6.8	4.6	4.8	3.65	3.66	3.50
13	3.58	4.6	4.1	4.0	4.2	7.4	6.7	4.6	4.6	3.63	3.74	3.46
14	3.60	4.5	4.3	4.1	5.7	7.5	6.9	4.6	4.6	3.60	3.88	3.48
15	3.66	4.4	4.2	4.2	8.1	13.3	8.6	5.1	4.7	3.65	4.1	3.70
16	3.72	4.3	4.3	4.1	8.7	†15.6	11.2	5.6	4.9	3.73	4.0	4.1
17	3.91	4.3	4.5	4.2	9.1	12.2	12.9	5.9	4.6	3.87	3.88	4.1
18	3.80	4.2	4.5	4.2	7.6	8.9	12.6	5.0	4.4	3.82	3.76	3.96
19	3.86	4.2	4.5	4.1	6.6	7.9	11.3	5.2	4.2	3.68	3.66	4.1
20	3.97	4.2	4.4	4.2	7.7	7.4	10.1	4.9	4.1	3.65	3.56	4.7
21	4.3	4.1	4.4	4.2	11.5	7.4	8.7	4.8	4.0	3.57	3.48	5.0
22	5.7	4.1	4.4	4.2	13.9	7.4	8.6	5.2	4.2	3.54	3.42	5.9
23	5.8	4.1	4.3	4.2	10.0	7.4	8.7	5.8	4.3	3.49	3.39	5.9
24	5.6	4.1	4.3	4.1	8.2	7.3	8.1	6.4	5.0	3.48	3.38	5.4
25	6.8	4.1	4.3	4.1	7.7	7.0	7.6	6.3	5.1	3.64	3.35	5.0
26	8.8	4.1	4.3	4.1	10.1	6.5	7.1	6.2	4.9	3.76	3.29	4.7
27	9.5	4.2	4.2	4.0	13.2	6.1	6.6	5.8	4.6	3.70	3.26	4.5
28	8.1	4.2	4.2	4.0	12.3	5.8	6.2	6.1	4.4	3.61	‡3.24	4.6
29	7.8	3.99	4.2	3.98	-------	5.6	5.8	6.8	4.3	3.54	‡3.25	4.9
30	9.6	3.96	4.1	3.94	-------	5.3	5.7	6.5	4.1	3.55	3.31	4.9
31	12.8	-------	4.0	3.90	-------	5.2	-------	6.2	-------	3.56	3.36	-------

NOTES—*Gage heights affected by ice December 9, 1917, to February 16, 1918, and discharge estimated from two discharge measurements under ice cover to-gether with climatological records. †Maximum 15.8 feet at 4:00 a. m. ‡Minimum 3.24 feet.

Daily Discharge, in second-feet, of Susquehanna River at Harrisburg, Dauphin County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	13,300	9,600	14,700	10,800	29,300	35,000	85,600	17,600	66,300	47,200	17,600	19,100
2	16,100	9,480	17,600	10,800	33,100	40,900	70,600	17,600	53,500	43,000	24,000	24,000
3	16,100	9,120	20,700	12,100	25,700	47,200	68,400	16,100	47,200	38,900	17,600	25,800
4	14,700	8,880	24,000	10,800	19,100	45,100	81,400	16,100	40,900	43,000	14,700	20,700
5	12,900	8,880	22,300	14,600	17,600	38,900	85,600	16,100	40,900	53,500	13,000	19,100
6	10,800	9,600	20,700	22,300	16,000	33,100	81,400	17,600	35,000	40,900	12,300	20,700
7	9,840	9,480	17,600	55,000	14,600	27,500	92,100	20,700	33,100	33,100	12,000	17,600
8	8,640	9,360	16,100	55,800	13,400	27,500	92,100	29,400	36,900	27,600	11,300	19,100
9	7,410	9,120	16,100	53,600	13,400	29,500	87,300	45,100	96,400	24,000	14,700	24,000
10	6,860	9,120	16,100	47,200	14,600	36,900	81,400	45,100	98,600	24,000	38,900	20,700
11	6,420	9,240	14,700	56,900	16,000	51,400	66,300	47,200	81,400	29,400	72,800	16,100
12	5,780	9,000	14,700	31,200	14,600	73,000	57,700	45,100	74,900	36,900	53,500	19,100
13	5,780	9,120	13,300	25,700	13,400	93,700	49,300	40,900	77,000	43,000	35,000	17,600
14	5,460	8,880	14,700	25,700	12,100	141,000	43,000	55,600	68,400	36,900	25,800	14,700
15	5,680	8,640	14,700	25,700	12,100	101,000	40,900	31,200	59,800	33,100	33,100	14,700
16	5,780	9,000	*7,550	25,700	12,100	81,400	38,900	27,600	53,500	33,100	40,000	13,000
17	5,780	9,360	7,550	29,300	12,100	70,600	35,000	25,800	47,200	31,200	68,400	11,700
18	*5,150	8,520	6,550	25,700	12,100	72,800	31,200	22,300	43,000	33,100	49,300	10,800
19	7,520	9,000	6,550	25,700	12,100	70,600	29,400	20,700	36,900	29,400	40,900	9,840
20	10,800	10,300	5,650	24,000	15,400	64,200	27,600	20,700	33,100	31,200	29,400	9,360
21	12,200	9,600	5,650	24,000	16,000	58,500	27,600	19,100	29,400	29,400	24,000	8,880
22	24,000	8,880	5,650	24,000	17,600	49,300	25,800	17,600	29,400	33,100	19,100	8,400
23	22,300	8,400	7,550	24,000	17,600	47,200	24,000	17,600	38,900	31,200	17,600	8,070
24	25,800	9,480	9,650	25,700	16,000	51,400	24,000	17,600	43,000	35,000	22,300	7,960
25	24,000	9,360	13,400	27,500	20,700	72,800	24,000	19,100	35,000	29,400	25,800	8,520
26	19,100	10,600	13,100	27,500	29,300	125,000	22,300	20,700	36,900	25,800	89,400	7,960
27	16,100	11,700	10,800	31,200	29,500	129,000	20,700	22,300	43,000	22,300	35,000	7,300
28	13,300	16,100	12,100	29,300	29,300	141,000	19,100	22,300	38,900	19,100	25,800	7,300
29	12,600	17,600	13,400	29,300	-------	†152,000	19,100	20,700	47,200	19,100	20,700	6,970
30	11,200	16,100	15,400	29,500	-------	139,000	17,600	22,300	57,700	20,700	20,700	6,750
31	10,300	-------	12,100	29,300	-------	141,000	-------	59,800	-------	19,100	17,600	-------

NOTES—*River frozen December 16, 1916, to March 13, 1917, and discharge estimated from climatological data and discharge at Holtwood. †Maximum 154,700 second-feet at 9 a. m. ‡Minimum 5,150 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	6,310	166,000	12,000	6,200	5,150	139,000	29,400	43,000	77,000	14,700	7,740	6,860
2	6,200	152,000	11,800	6,200	5,150	127,000	25,800	40,900	66,300	17,600	6,970	7,520
3	6,100	101,000	13,000	6,200	5,150	178,000	25,800	38,900	49,300	16,100	6,420	9,600
4	5,990	79,200	13,000	6,200	4,100	125,000	25,800	36,900	58,900	14,700	5,990	8,640
5	6,160	57,700	11,800	6,200	4,100	98,600	25,800	36,900	31,200	13,300	6,310	10,300
6	6,200	47,200	13,300	6,200	4,100	81,400	27,600	35,000	27,600	12,900	8,640	8,640
7	6,310	40,900	13,000	6,200	5,150	74,900	31,200	31,200	25,800	11,900	10,300	11,000
8	6,970	35,000	13,000	5,150	5,150	73,200	27,600	31,200	24,000	11,200	7,960	12,800
9	7,300	31,200	8,400	5,150	5,150	81,400	25,800	27,600	24,000	10,400	6,860	10,300
10	7,630	29,400	6,200	5,150	5,150	77,000	33,100	25,800	25,800	9,720	9,600	9,120
11	8,180	25,800	6,200	5,150	6,200	83,500	51,400	24,000	27,600	9,240	7,740	7,740
12	8,180	24,000	5,150	5,150	7,300	85,600	66,300	22,300	25,800	9,000	9,120	7,300
13	8,180	22,300	4,100	5,150	10,800	79,200	64,200	22,300	22,300	8,760	10,100	6,860
14	8,400	20,700	5,150	6,200	22,300	81,400	58,400	22,300	22,300	8,400	11,800	7,080
15	9,120	19,100	6,200	6,200	62,000	218,000	105,000	31,200	24,000	9,000	14,700	9,600
16	9,840	17,600	7,300	6,200	101,000	†282,000	164,000	40,900	27,600	9,960	13,300	14,700
17	12,200	17,600	8,400	6,880	116,000	188,000	207,000	47,200	22,300	11,700	11,800	14,700
18	11,900	16,100	9,600	7,300	85,500	112,000	199,000	40,900	19,100	11,000	10,400	12,800
19	11,600	16,100	9,600	7,300	62,000	94,000	166,000	33,100	16,100	9,360	9,120	14,700
20	12,900	16,100	9,600	7,300	85,600	79,200	139,000	27,600	14,700	9,000	7,960	24,000
21	17,600	14,700	8,400	7,300	171,000	79,200	107,000	25,800	13,300	8,070	7,080	29,400
22	43,000	14,700	8,400	6,800	234,000	79,200	105,000	33,100	16,100	7,740	6,420	47,200
23	45,100	14,700	8,400	6,860	156,000	79,200	107,000	45,100	17,600	7,190	6,160	47,200
24	40,900	14,700	8,400	6,860	96,400	77,000	94,200	57,700	29,400	7,080	5,990	36,900
25	66,300	14,700	9,600	6,200	85,600	70,600	83,500	55,600	31,200	8,880	5,680	29,400
26	110,000	14,700	8,400	6,200	159,000	59,800	72,800	53,500	27,600	10,300	5,040	24,000
27	118,000	16,100	8,400	6,200	215,000	51,400	62,000	45,100	22,300	9,600	4,730	20,700
28	94,200	16,100	7,300	6,200	191,000	45,100	53,500	51,400	19,100	8,520	‡4,520	22,300
29	87,800	13,200	6,200	6,200	-------	46,900	45,100	66,300	17,600	7,740	‡4,620	27,600
30	127,000	12,800	6,200	6,200	-------	35,000	43,000	59,800	14,700	7,850	5,260	27,600
31	204,000	-------	6,200	6,200	-------	33,100	-------	53,500	-------	7,960	5,780	-------

NOTES—*Gage heights affected by ice December 9, 1917, to February 16, 1918, and discharge estimated from two discharge measurements together with climatological records. †Maximum 288,000 second-feet observed at 4:00 a. m. ‡Minimum 4,520 second-feet.

Estimated Monthly Discharge of Susquehanna River at Harrisburg, Dauphin County
(Drainage area, 24,100 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	25,800	5,150	12,600	0.52	0.58
November	17,600	8,400	10,100	0.42	0.47
December	24,000		13,260	0.55	0.63
January			27,400	1.14	1.31
February			18,000	0.75	0.78
March	152,000		72,800	3.02	3.48
April	92,100	17,600	49,000	2.03	2.26
May	59,800	16,100	26,460	1.10	1.27
June	98,000	29,400	50,800	2.11	2.35
July	53,500	19,100	32,200	1.34	1.54
August	72,800	11,300	28,560	1.18	1.36
September	25,800	6,750	14,200	0.59	0.66
The year	152,000		29,600	1.23	16.69

NOTES—River frozen December 16, 1916, to March 13, 1917, and discharge estimated from climatological data and discharge at Holtwood. Maximum 154,000 second-feet at 9 a. m. March 29. Minimum 5,150 second-feet October 18.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	204,000	5,990	36,100	1.50	1.73
November	166,000	12,800	35,400	1.47	1.64
December			8,800	0.37	0.43
January			6,220	0.26	0.30
February	234,000		66,960	2.78	2.90
March	282,000	33,100	97,100	4.03	4.65
April	207,000	25,800	76,000	3.15	3.51
May	66,300	22,300	38,900	1.61	1.86
June	77,000	18,300	27,400	1.14	1.27
July	17,600	7,080	10,360	0.43	0.49
August	14,700	4,520	7,850	0.33	0.38
September	47,250	6,860	17,660	0.73	0.81
The year	282,000		35,400	1.47	19.97

NOTES—Gage heights affected by ice December 9, 1917, to February 16, 1918, and discharge estimated from two discharge measurements under ice cover together with climatological records. Maximum 288,000 second-feet March 16. Minimum 4,520 second-feet August 28 and 29.

SUSQUEHANNA BASIN—STATION NO. 37

YELLOW BREECHES CREEK AT OLMSTED'S MILL, CUMBERLAND COUNTY

DESCRIPTION OF STATION

Location—At single span, steel, through truss, highway bridge just below mill dam about one mile south of White Hill Station, Cumberland County.

Records Available—Discharge complete from March 23, 1909, to October 31, 1909, and January 22, 1910, to September 30, 1918.

Drainage Area—223 square miles.

Gage—A standard chain gage, whose elevation of zero is arbitrary, is located on the downstream side of the bridge and is read twice daily by C. Arthur Hertzler. A Sanborn automatic gage is located on the right abutment.

Channel—Both banks are high and not subject to overflow, and the bed is fairly permanent.

Remarks.—The tail-race of a mill on the left bank 300 feet above the bridge comes in a short distance above the left abutement. Water runs over the mill dam at all stages. This stream keeps up a remarkably high dry weather flow on account of limestone springs upon its watershed.

Discharge Measurements of Yellow Breeches Creek at Olmsted's Mill, Cumberland County
(Drainage area, 223 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
36	Mar. 22	Bowen & Weaver	382	2.08	534	0.2 & 0.8 method
37	April 18	Bowen & Weaver	312	1.46	326	0.2 & 0.8 method
38	Aug. 10	Reckord & Shade	286	1.28	264	0.6 method.
39	Aug. 22	Reckord & Bowen	233	0.87	140	0.2 & 0.8 method
40	Sept. 8	Reckord & Wilson	358	1.83	430	0.2 & 0.8 method
	1918					
41	July 31	Reckord & Shade	292	1.25	243	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Yellow Breeches Creek at Olmsted's Mill, Cumberland County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.18	1.10	1.08	1.06	1.5	1.3	1.7	1.4	1.10	1.02	-------	0.90
2	1.16	1.12	1.10	1.04	1.5	1.3	1.7	1.4	1.11	1.00	-------	0.96
3	1.18	1.12	1.12	1.06	1.5	1.7	1.7	1.3	1.8	1.00	-------	0.92
4	1.18	1.14	1.10	1.04	1.5	1.9	1.7	1.3	1.3	1.01	-------	0.86
5	1.16	1.14	1.08	1.06	1.5	1.9	1.7	1.3	1.3	1.02	-------	1.02
6	1.18	1.12	1.07	1.06	1.5	1.8	1.7	1.4	1.4	1.00	-------	0.98
7	1.17	1.12	1.08	1.07	1.5	1.7	1.8	1.3	1.3	0.99	-------	0.94
8	1.2	1.12	1.00	1.06	1.5	1.6	1.7	1.3	1.2	1.02	-------	1.5
9	1.15	1.13	1.04	1.07	1.5	1.6	1.7	1.3	1.2	1.08	-------	1.10
10	1.13	1.12	1.08	1.06	1.5	1.8	1.7	1.3	1.2	1.8	-------	0.94
11	1.13	1.14	1.08	1.04	1.5	2.1	1.7	1.4	1.10	1.8	-------	0.91
12	1.14	1.10	1.06	1.06	1.5	2.8	1.7	1.3	1.11	1.6	-------	0.92
13	1.11	1.12	1.08	1.10	1.5	3.0	1.7	1.3	1.07	1.4	-------	0.92
14	1.15	1.12	1.05	1.3	1.6	2.8	1.6	1.2	1.08	1.5	-------	0.91
15	1.14	1.12	1.05	1.16	1.6	2.6	1.6	1.19	1.10	1.4	-------	1.10
16	1.13	1.19	1.04	1.06	1.6	2.1	1.6	1.19	1.08	1.5	-------	1.00
17	1.16	1.12	1.01	1.09	1.6	1.8	1.5	1.17	1.10	1.7	-------	0.96
18	1.16	1.14	1.04	1.10	1.9	1.8	1.5	1.19	1.04	1.5	-------	0.95
19	1.5	1.12	1.06	1.08	†2.7	1.8	1.5	1.17	1.02	1.3	-------	0.92
20	1.6	1.10	1.04	1.08	2.7	1.7	1.5	1.2	1.00	1.3	-------	0.92
21	1.2	1.09	1.04	1.4	2.4	1.8	1.5	1.19	1.03	1.3	-------	0.90
22	1.18	1.12	1.09	2.0	2.2	2.1	1.4	1.19	1.00	1.3	0.87	0.92
23	1.16	1.12	1.10	1.7	2.0	1.9	1.4	1.2	1.02	**	1.4	0.92
24	1.18	1.08	1.06	1.6	2.0	1.9	1.4	1.17	1.01	-------	1.2	0.94
25	1.16	1.08	1.04	1.5	2.0	1.8	1.4	1.14	1.02	-------	1.07	0.92
26	1.16	1.10	1.06	1.5	1.8	1.7	1.4	1.11	1.00	-------	0.91	0.93
27	1.18	1.08	1.08	1.5	1.6	1.8	1.4	1.11	1.02	-------	0.87	0.92
28	1.16	1.07	1.10	1.6	1.4	1.7	1.4	1.3	0.98	-------	0.88	0.96
29	1.16	1.11	1.06	1.5	-------	1.7	1.6	1.2	1.02	-------	0.88	0.94
30	1.14	1.11	1.04	1.6	-------	1.7	1.4	1.2	1.00	-------	0.86	0.92
31	1.10	-------	1.04	1.6	-------	1.7	-------	1.2	-------	-------	0.94	-------

NOTES—**Gage heights unreliable July 23 to August 21, 1917, inclusive. †Maximum 3.4 feet at 9 p. m. estimated from hydrograph.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.92	††2.2	1.17	0.99	0.97	3.3	1.4	2.2	1.4	1.3	1.01	0.91
2	0.92	2.1	1.15	0.97	0.95	2.9	1.4	2.0	1.3	1.2	0.99	0.87
3	0.94	2.0	1.17	0.91	0.93	2.7	1.4	1.8	1.3	1.11	0.92	0.91
4	0.94	1.8	1.11	0.91	0.97	2.6	1.4	1.8	1.3	1.09	0.92	0.91
5	0.93	1.8	1.11	0.91	0.75	2.6	1.4	1.8	1.3	1.09	1.8	‡0.73
6	0.90	1.7	1.14	0.91	0.94	2.5	1.3	1.7	2.4	1.03	1.4	0.87
7	0.92	1.6	1.07	1.02	1.03	2.5	1.3	1.7	2.8	1.05	1.01	0.85
8	0.92	1.5	1.03	0.96	1.01	2.3	1.3	1.7	1.7	1.06	0.95	0.92
9	0.90	1.4	0.75	0.95	1.02	2.2	1.6	1.6	1.5	1.01	0.93	0.96
10	0.90	1.4	0.94	0.92	1.02	2.4	2.6	1.6	1.4	0.98	1.17	0.89
11	0.90	1.4	0.87	0.99	1.07	2.1	2.9	1.8	1.6	1.09	1.5	0.89
12	0.94	1.4	0.99	1.25	1.2	2.0	2.6	1.6	1.6	1.01	1.4	0.83
13	0.92	1.4	1.05	0.95	2.1	1.9	2.6	1.8	1.4	1.07	1.15	0.87
14	0.90	1.3	0.97	1.15	2.2	2.5	3.0	1.9	1.3	1.03	1.11	0.92
15	0.88	1.2	0.95	1.07	2.3	2.2	3.7	1.6	1.4	1.06	1.15	0.87
16	0.90	1.2	1.01	1.06	2.8	2.0	4.0	1.5	1.3	1.02	1.03	0.95
17	0.90	1.19	1.05	1.07	2.2	1.9	3.9	1.5	1.3	0.97	0.95	0.91
18	0.90	1.19	1.07	1.07	2.0	1.9	3.8	1.5	1.2	0.99	0.98	0.99
19	††1.0	1.18	1.06	0.98	2.4	1.8	3.4	1.4	1.2	0.94	0.97	0.99
20	††1.2	1.15	1.07	0.91	6.3	1.7	3.0	1.4	1.17	0.91	0.95	1.08
21	††1.1	1.16	1.11	0.93	4.0	1.7	3.3	2.3	1.18	0.93	0.97	1.3
22	††1.0	1.2	1.01	0.96	3.0	1.7	4.0	2.3	1.5	0.95	0.89	1.04
23	††0.9	1.19	1.00	0.95	2.6	1.6	3.3	1.9	1.4	0.83	0.93	0.95
24	††1.9	1.11	1.09	0.99	2.5	1.6	3.0	1.7	1.2	0.88	0.90	0.95
25	††2.9	1.08	0.99	1.01	3.0	1.6	2.7	1.6	1.19	1.6	0.86	0.93
26	††2.1	1.10	1.05	0.96	†6.1	1.6	2.5	1.5	1.19	1.2	0.94	0.92
27	††2.0	1.08	1.01	0.96	4.8	1.5	2.3	1.5	1.14	1.02	0.91	0.87
28	††2.0	1.05	0.99	0.89	3.6	1.5	2.2	1.5	1.14	0.96	0.90	0.83
29	††1.9	1.03	0.81	0.98	-------	1.4	2.1	1.5	1.2	0.97	0.92	0.85
30	††2.9	1.11	0.81	1.02	-------	1.4	2.2	1.4	1.2	1.15	0.96	0.91
31	††3.2	-------	0.89	0.99	-------	1.4	-------	1.4	-------	1.3	1.01	-------

NOTES—††Estimated. †Maximum 6.8 feet at 5:00 a. m. ‡Minimum 0.63 feet.

Daily Discharge, in second-feet, of Yellow Breeches Creek at Olmsted's Mill, Cumberland County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	224	200	194	189	326	260	396	292	200	178	-------	147
2	218	206	200	183	326	260	396	292	202	172	-------	162
3	224	206	206	189	326	396	396	260	432	172	-------	152
4	224	212	260	183	326	470	396	260	260	177	-------	159
5	218	212	194	189	326	470	396	260	260	178	-------	178
6	224	206	192	189	326	432	396	292	292	172	-------	167
7	221	206	194	192	326	396	432	260	260	169	-------	157
8	230	260	189	189	326	360	396	260	230	178	-------	470
9	215	209	183	192	326	360	396	260	250	194	-------	260
10	212	206	194	189	326	432	396	260	230	432	-------	157
11	200	212	194	18[illegible]	326	548	396	292	200	432	-------	149
12	212	200	189	189	326	859	396	260	206	260	-------	152
13	212	206	194	200	328	955	396	260	192	292	-------	159
14	215	206	186	200	360	859	360	230	194	326	-------	149
15	212	202	183	218	360	764	360	227	200	292	-------	200
16	212	200	183	189	260	548	260	227	194	326	-------	172
17	218	206	175	197	360	422	326	221	200	296	-------	162
18	218	212	183	200	470	432	326	227	183	326	-------	159
19	326	206	189	194	†801	432	326	221	178	260	-------	152
20	360	200	183	194	891	296	326	230	172	260	-------	152
21	230	197	183	202	674	422	326	227	180	260	-------	147
22	224	206	197	508	588	548	292	227	172	260	141	152
23	218	206	200	396	508	470	292	230	178	**	292	152
24	224	194	189	360	508	470	292	221	175	-------	230	159
25	218	194	183	326	508	432	292	212	178	-------	192	152
26	218	200	189	326	432	296	292	203	172	-------	149	154
27	224	194	194	326	360	432	292	203	178	-------	141	152
28	218	192	200	360	292	396	292	260	167	-------	143	162
29	218	203	189	326	-------	296	360	230	178	-------	143	157
30	212	203	183	360	-------	296	292	230	172	-------	139	152
31	200	-------	183	360	-------	396	-------	230	-------	-------	157	-------

NOTES—**Gage heights unreliable July 23 to August 21, 1917, inclusive, and, therefore, discharge is withheld. †Maximum=1,160 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	152	††580	221	170	164	1,080	290	580	290	260	175	170
2	152	540	215	164	160	885	290	500	260	250	170	141
3	157	500	221	150	154	795	290	430	260	203	152	150
4	157	430	203	150	164	750	290	430	260	197	152	150
5	154	430	203	150	117	750	290	430	260	197	430	‡113
6	147	395	212	150	157	705	260	395	680	180	290	141
7	152	360	192	178	180	705	260	395	840	186	175	136
8	152	325	180	162	175	620	260	395	395	189	160	152
9	147	290	117	160	180	580	260	360	325	175	154	147
10	147	290	157	154	180	660	750	360	290	167	221	145
11	147	295	141	170	192	540	885	420	360	178	325	145
12	157	290	170	245	230	500	750	360	330	175	290	132
13	152	290	183	160	540	465	750	420	290	192	215	141
14	147	260	164	215	580	705	930	465	260	180	203	152
15	143	260	160	192	620	580	1,200	360	290	189	215	141
16	147	230	175	189	840	500	1,480	325	260	178	180	160
17	147	227	186	192	580	465	1,420	325	260	164	160	150
18	147	227	192	192	500	465	1,360	325	230	170	167	170
19	††172	224	189	167	660	430	1,130	290	230	156	164	170
20	††230	215	192	150	3,100	395	930	290	221	150	160	194
21	††200	218	203	154	1,480	395	1,080	620	224	154	164	210
22	††172	230	175	162	930	395	1,480	620	325	160	145	183
23	††147	227	172	160	750	360	1,080	465	290	152	154	160
24	††465	203	197	170	705	360	930	297	230	143	147	160
25	††885	194	170	175	930	360	795	360	227	360	145	154
26	††540	200	183	162	†2,970	370	705	325	227	230	157	152
27	††500	194	175	162	1,970	325	620	325	212	178	150	141
28	††360	183	170	145	1,240	325	580	325	212	162	147	136
29	††465	180	128	167	-------	290	540	325	230	164	152	136
30	††885	203	128	180	-------	290	580	290	230	215	162	150
31	††1,030	-------	145	170	-------	296	-------	290	-------	260	175	-------

NOTES—††Estimated. †Maximum 3,540 second-feet from hydrograph at 5:00 a. m. ‡Minimum 97 second-feet.

Estimated Monthly Discharge of Yellow Breeches Creek at Olmsted's Mill, Cumberland County
(Drainage area, 223 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	350	200	226	1.01	1.15
November	212	192	204	0.91	1.02
December	206	175	190	0.85	0.98
January	308	183	253	1.13	1.30
February	†801	292	415	1.86	1.94
March	955	260	478	2.14	2.47
April	432	292	353	1.58	1.76
May	292	203	244	1.09	1.26
June	432	167	209	0.94	1.05
July**					
August					
September	470	139	169	0.76	0.85

NOTES—**Gage heights unreliable July 28 to August 21, 1917, inclusive, and, therefore, discharge is withheld. †Maximum=1,160 second-feet, February 19, 1917.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	1,030	143	287	1.29	1.49
November	580	180	290	1.30	1.45
December	231	117	178	0.80	0.92
January	245	145	170	0.76	0.88
February	3,100	117	729	3.27	3.40
March	1,080	290	527	2.36	2.72
April	1,480	260	756	3.39	3.78
May	620	290	394	1.77	2.04
June	840	212	301	1.35	1.51
July	310	152	190	0.85	0.98
August	430	145	189	0.85	0.98
September	260	113	154	0.69	0.77
The year	3,100	113	343	1.54	20.92

NOTES—Maximum 3,540 second-feet February 26. Minimum 97 second-feet September 5.

SUSQUEHANNA BASIN—STATION NO. 38

CODORUS CREEK AT YORK

DESCRIPTION OF STATION

Location—At three span, steel, through truss, highway bridge known as South Penn Street Bridge, York, York County.

Records Available—Discharge measurements and gage heights from October 7, 1915, to September 30, 1918.

Drainage Area—221 square miles.

Gage—A standard chain gage, whose elevation of zero is 351.79 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by an employe of the Schmidt and Ault Paper Co.

Channel—The right bank is high and does not overflow, the left is high but may overflow during extreme stages, and the bed is composed of mud and gravel.

Remarks—There is a dam about 250 feet above and riffle about 800 feet below the station which act as control points.

Discharge Measurements of Codorus Creek at York, York County
(Drainage area, 221 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq.ft.	Feet	Sec.-ft.	
7	Mar. 28	Bowen & Weaver	299	2.40	437	0.6 method
8	April 3	Bowen & Weaver	202	1.70	256	0.6 method
9	April 10	Bowen & Weaver	271	2.06	348	0.6 method
10	Aug. 24	Wilson	180	1.69	210	0.2 & 0.8 method
	1918					
11	Feb. 11	Boehringer & Reckord	176	1.66	172	0.2 & 0.8 method
12	Apr. 11	Landis & Lichty	684	4.92	1,511	0.2 & 0.8 method
13	Apr. 11	Landis & Lichty	625	4.57	1,339	0.2 & 0.8 method
14	Apr. 12	Landis & Lichty	551	4.10	1,133	0.2 & 0.8 method
15	Aug. 2	Reckord & Shade	60	0.96	48	Surface method

Daily Mean Gage Heights, in feet, of Codorus Creek at York, York County, for the period October 1, 1916, to September 3, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.77	1.04	0.60	1.88	1.84	1.73	1.79	1.33	1.53	0.84	1.18	0.73
2	1.28	0.97	0.80	1.78	1.76	1.84	1.72	1.16	1.56	0.87	0.97	0.91
3	1.19	1.00	0.97	1.92	1.59	1.77	1.64	1.07	1.53	0.83	0.88	1.09
4	1.12	1.00	0.80	2.20	1.54	1.89	1.57	1.14	1.64	0.72	0.80	0.78
5	1.66	1.03	0.71	2.61	1.55	1.88	1.69	1.13	2.23	0.77	0.98	0.84
6	1.24	1.00	0.66	2.37	1.58	1.94	2.94	1.24	2.26	0.90	1.03	0.98
7	1.08	1.10	0.84	1.85	1.58	2.06	2.13	1.26	4.03	1.18	1.32	0.86
8	1.57	1.02	0.72	1.69	1.59	2.89	2.14	1.30	2.73	2.41	3.16	0.85
9	1.38	1.04	0.76	1.76	1.35	5.33	2.09	1.08	2.85	2.64	3.59	0.80
10	1.08	1.10	0.69	1.69	1.21	3.14	2.02	0.99	2.91	2.50	2.34	0.71
11	1.03	1.02	0.72	1.68	1.12	†6.13	1.94	0.91	2.53	2.89	1.93	0.83
12	1.06	1.17	0.85	1.64	1.07	6.54	1.89	0.85	2.16	2.98	1.38	0.74
13	1.07	1.00	0.88	1.74	1.88	3.33	1.71	1.03	2.00	2.86	1.18	0.85
14	1.14	0.84	0.81	1.74	0.97	2.84	1.67	1.06	1.99	2.87	1.08	0.94
15	1.00	0.74	0.74	1.79	0.93	2.40	1.61	1.10	2.13	2.94	0.94	2.39
16	1.00	‡0.54	0.63	1.69	0.97	2.14	1.57	0.86	1.77	2.51	0.93	4.29
17	0.99	0.67	1.14	1.83	1.13	1.93	1.67	0.89	1.58	2.34	0.66	1.89
18	1.09	0.84	1.22	1.94	1.49	1.84	1.52	0.69	1.19	2.18	0.73	1.34
19	1.95	0.88	1.12	1.80	1.60	1.71	1.38	0.70	1.09	2.14	0.64	1.11
20	1.70	0.67	1.04	1.80	1.45	1.76	1.42	1.01	1.00	2.38	0.61	0.89
21	1.49	0.72	1.16	2.67	1.41	1.82	1.40	1.24	0.94	2.13	0.81	0.96
22	1.20	0.56	1.89	5.14	1.35	1.78	1.45	1.17	0.85	1.75	0.76	0.99
23	1.12	0.64	2.29	2.29	1.46	1.82	1.44	1.05	1.01	1.58	0.86	1.01
24	1.00	0.63	1.68	2.04	3.57	1.86	1.37	1.23	0.88	1.43	1.47	0.98
25	1.00	0.70	1.90	2.30	1.97	2.05	1.26	1.24	0.93	1.32	0.90	0.77
26	1.10	0.70	2.40	2.19	1.82	2.05	1.36	1.39	1.21	1.32	0.88	0.86
27	1.04	0.59	2.55	2.25	1.69	2.19	1.37	1.23	1.28	1.39	0.96	1.14
28	0.97	0.60	3.02	2.14	1.71	2.35	1.45	1.42	1.08	1.22	0.72	1.13
29	1.11	0.68	2.78	2.41	-------	2.22	1.48	1.80	0.80	1.37	0.63	0.89
30	1.06	0.59	2.05	2.64	-------	2.03	1.44	1.74	0.89	1.22	0.73	0.78
31	0.98	-------	1.92	1.85	-------	1.85	-------	1.65	-------	1.27	0.84	-------

NOTES—†Maximum 11.00 feet at 8 p. m. estimated from hydrograph. ‡Minimum 0.49 feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.88	2.58	1.62	1.51	1.38	1.66	1.47	2.21	1.47	1.45	1.22	1.05
2	0.91	2.26	1.57	1.31	1.41	1.68	1.51	2.07	1.49	0.90	0.96	1.01
3	0.80	1.76	1.64	0.91	1.41	1.65	1.49	2.05	1.42	0.98	1.05	1.02
4	0.84	1.59	1.62	0.87	1.48	1.54	1.51	2.09	1.44	1.20	0.98	1.01
5	0.94	1.68	1.52	0.99	1.48	1.37	1.48	2.07	1.46	1.05	1.52	0.92
6	0.88	1.47	1.56	1.08	1.34	1.45	1.55	2.16	1.72	1.08	1.40	0.92
7	0.71	1.36	1.59	1.21	1.23	1.44	1.55	1.88	1.32	1.02	0.95	0.96
8	0.89	1.29	1.59	1.24	1.48	1.59	2.07	1.71	0.88	1.02	0.72	0.92
9	0.83	1.21	*1.65	1.34	1.68	1.78	2.84	1.71	1.18	0.98	‡0.72	1.22
10	0.75	1.18	1.38	1.68	1.68	1.82	4.61	1.64	1.25	0.98	0.98	1.16
11	0.83	1.14	1.36	2.09	1.76	1.78	4.85	3.56	1.42	0.78	0.98	1.12
12	1.56	1.17	1.22	4.73	2.61	1.81	4.16	2.04	1.32	‡0.68	1.15	1.05
13	1.19	1.09	1.11	3.26	8.76	2.16	3.86	2.01	1.02	0.90	1.08	1.01
14	0.98	1.09	1.12	2.53	5.41	1.81	3.58	2.11	1.10	1.08	1.12	0.99
15	0.91	1.11	1.05	2.96	†8.66	2.01	3.54	1.77	1.38	1.18	1.88	1.08
16	0.87	1.09	1.04	2.23	4.86	1.88	3.36	1.71	1.22	0.92	1.70	0.95
17	0.76	1.15	1.19	1.61	2.61	1.77	2.71	1.74	1.18	0.92	1.60	0.88
18	0.99	1.17	1.24	1.57	2.11	1.72	2.47	1.78	0.98	1.20	1.68	0.89
19	2.19	1.10	1.28	1.51	3.81	1.56	2.42	1.78	1.15	1.00	1.38	0.91
20	1.78	1.18	1.36	1.44	8.81	1.43	2.62	1.84	1.35	0.98	1.20	0.95
21	1.58	1.20	1.19	1.40	3.21	1.46	3.51	1.80	1.30	0.92	0.98	1.11
22	1.41	1.32	1.31	1.39	2.41	1.48	3.41	3.92	1.40	0.82	0.88	1.04
23	2.79	1.28	1.38	1.39	2.41	1.41	3.08	2.15	1.28	0.82	1.60	0.95
24	4.23	1.37	1.47	1.35	2.18	1.48	2.86	1.66	1.15	0.80	0.95	0.87
25	2.88	1.36	1.53	1.38	2.34	1.44	2.51	1.49	0.90	2.05	1.15	0.95
26	2.29	1.36	1.38	1.32	5.53	1.42	2.24	1.52	0.92	1.18	1.32	0.91
27	1.88	1.32	1.38	1.35	2.16	1.42	2.16	1.59	0.98	1.12	1.15	0.94
28	4.16	1.27	1.48	1.39	1.81	1.50	2.16	1.47	1.02	0.95	1.02	1.03
29	2.56	1.29	1.54	1.37	-------	1.47	2.18	1.46	1.18	0.82	0.95	0.84
30	5.66	1.33	1.43	1.42	-------	1.46	2.11	1.52	1.28	‡0.72	0.91	0.91
31	3.13	-------	1.38	1.37	-------	1.52	-------	1.49	-------	1.48	0.96	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 13, 1918. †Maximum 11.0 feet at 8:00 p. m. ‡Minimum 0.65 feet.

OHIO BASIN

ALLEGHENY RIVER NEAR LARABEE

DESCRIPTION OF STATION

Location—At single span, steel, through truss, highway bridge between Larabee and Corryville, McKean County.

Records Available—Discharge measurements and gage heights from June 29, 1915, to September 30, 1918. For other records on this river see Allegheny River at Franklin, Kittanning and Freeport; also Allegheny River at Red House, N. Y. in the 1911 to 1914 reports of the Water Supply Commission.

Drainage Area—545 square miles.

Gage—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge and is read twice daily by Mrs. A. L. Dowley.

Channel—The right bank is high and not subject to overflow, the left bank is low and overflows, and the bed is composed of mud, gravel and stones.

Remarks—This station is maintained in co-operation with the U. S. Engineer Office in Pittsburgh.

Discharge Measurements of Allegheny River near Larabee, McKean County
(Drainage area, 545 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
4	Mar. 21	Reckord	1,103	7.47	1,944	0.2 & 0.8 method
5	May 14	Wilson	770	5.21	1,061	0.2 & 0.8 method
6	Aug. 2	Wilson	363	1.96	293	0.2 & 0.8 method
7	Nov. 19	Wilson	383	2.05	311	0.2 & 0.8 method
	1918					
8	July 23	Reckord & Shade	226	0.68	78	0.6 method

Daily Mean Gage Heights, in feet, of Allegheny River near Larabee, McKean County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.8	1.5	5.3	2.6	5.0	9.4	8.8	2.8	8.5	4.5	2.1	3.6
2	0.7	1.6	4.6	2.8	5.0	8.3	9.4	2.7	7.9	9.8	1.9	3.8
3	0.7	1.4	4.1	2.7	3.9	**	10.0	2.5	6.9	9.0	1.8	3.4
4	0.7	1.2	3.8	2.9	3.6	-------	9.4	2.4	6.1	7.2	1.5	2.6
5	0.7	1.2	3.7	3.6	3.6	-------	8.4	3.2	5.4	5.7	1.4	2.2
6	0.6	1.2	3.3	8.8	3.6	-------	8.9	5.9	5.7	4.7	1.3	1.8
7	0.7	1.1	2.9	7.9	3.4	-------	9.2	5.7	9.9	4.0	1.2	1.7
8	0.7	1.1	2.7	6.4	3.3	-------	8.4	6.2	11.9	4.4	1.3	1.7
9	0.7	1.1	2.6	6.0	3.2	-------	7.6	6.2	12.3	5.8	2.7	1.7
10	0.7	2.0	2.4	6.1	2.9	-------	6.7	7.6	12.1	5.3	1.9	1.5
11	0.8	1.9	2.1	5.2	2.8	-------	6.0	6.9	11.0	10.2	1.4	1.4
12	0.7	1.6	*2.3	3.5	2.6	-------	5.6	6.3	11.5	11.0	1.3	1.3
13	0.7	1.4	2.2	*3.9	2.5	-------	5.2	5.8	10.1	10.0	1.1	1.0
14	1.5	1.8	2.9	4.1	2.5	-------	4.7	5.2	8.1	8.4	3.8	1.2
15	1.3	2.1	2.8	4.0	2.5	-------	4.6	4.6	6.4	7.2	9.6	1.1
16	0.9	1.8	2.8	3.7	2.6	-------	4.4	4.1	5.7	6.0	12.0	1.1
17	0.8	1.7	2.7	3.4	2.6	-------	3.8	3.8	4.8	5.2	9.8	0.9
18	0.8	1.6	2.6	3.4	3.0	-------	3.6	3.6	4.1	5.6	6.2	1.0
19	0.9	1.5	2.5	3.3	3.8	-------	3.6	3.8	3.8	6.4	4.6	0.9
20	3.6	1.5	2.4	3.2	3.6	-------	4.2	5.6	3.3	7.7	3.8	0.9
21	3.2	1.4	2.4	3.2	3.2	7.3	4.1	5.0	3.0	6.6	3.3	0.9
22	2.6	1.4	2.5	4.4	3.1	6.8	4.2	6.7	2.6	5.6	3.0	0.8
23	2.1	1.4	2.5	5.9	2.3	7.3	3.7	7.5	2.4	4.8	2.7	0.6
24	1.8	3.6	2.5	5.0	4.2	10.1	3.6	7.1	5.3	4.2	2.7	0.8
25	1.6	3.4	2.5	4.6	5.1	11.4	3.4	7.0	3.9	4.4	2.3	0.8
26	1.5	2.9	2.3	3.8	5.2	11.2	3.4	6.1	3.3	3.6	1.9	0.7
27	1.4	3.0	2.6	3.3	9.0	11.2	3.1	6.2	5.7	4.0	1.6	0.7
28	1.3	3.0	3.8	3.5	9.9	11.3	2.9	7.4	4.1	3.1	1.5	0.7
29	1.0	4.9	3.8	3.5	-------	11.0	2.8	9.7	4.6	2.7	1.6	0.8
30	0.9	6.0	3.3	3.9	-------	10.3	2.9	9.6	5.2	3.0	2.6	0.7
31	0.9	-------	2.9	4.5	-------	8.9	-------	8.6	-------	2.5	2.8	-------

Notes—*River frozen December 12, 1916, to January 6, 1917 and January 13 to March 11, 1917, inclusive. **Gage heights March 3 to 20, 1917, inclusive, unreliable.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.2	11.4	2.2	1.8	1.8	12.6	3.2	3.6	4.6	2.4	1.0	2.4
2	1.0	10.4	2.2	1.7	1.8	13.8	3.1	3.4	††4.1	2.2	0.8	1.8
3	0.9	8.6	1.5	1.7	1.8	11.8	3.8	3.2	††3.8	1.6	0.8	1.6
4	1.4	6.7	1.2	1.6	1.8	10.6	5.0	3.1	††3.5	1.4	0.8	1.3
5	2.1	5.7	1.6	1.6	1.8	9.0	4.6	3.1	††3.2	1.3	2.0	1.2
6	1.6	5.1	1.5	1.6	1.7	9.5	4.0	3.1	††3.0	1.3	1.5	3.2
7	1.2	4.6	1.5	1.7	1.7	10.2	3.8	2.8	††2.8	1.2	1.2	2.1
8	1.1	4.1	*1.2	1.7	1.7	9.3	3.8	3.2	††2.4	1.1	1.3	1.8
9	1.2	3.8	1.7	1.8	1.7	8.2	5.0	2.9	††2.0	1.1	1.4	1.6
10	1.1	3.5	1.8	2.4	1.8	10.2	4.5	2.8	††1.8	1.1	1.4	1.4
11	1.0	3.2	2.2	3.0	2.0	10.2	4.6	3.4	††2.4	1.2	2.8	1.1
12	1.4	3.3	1.8	-------	2.6	8.8	4.6	3.2	6.4	1.0	2.3	1.4
13	3.1	2.8	1.7	-------	9.0	8.5	4.7	3.8	4.5	1.0	1.9	5.7
14	2.1	2.6	1.8	2.0	9.2	11.6	7.2	4.7	3.2	0.9	2.2	3.9
15	2.5	2.5	2.4	2.0	9.8	†13.6	8.6	4.4	2.6	0.9	2.1	3.2
16	3.4	2.5	1.8	2.0	10.2	12.2	8.6	4.2	2.2	0.8	2.1	3.0
17	2.4	2.4	1.8	2.0	8.3	11.2	9.2	4.0	2.6	0.8	1.7	4.5
18	2.3	2.3	1.7	2.0	6.2	10.0	9.6	3.5	2.3	0.8	1.4	4.4
19	4.2	2.0	1.7	2.0	6.1	8.2	9.6	3.4	1.8	0.8	1.3	3.7
20	10.4	2.1	1.8	1.9	13.5	7.2	8.5	3.2	1.6	0.7	1.1	6.8
21	11.0	2.2	2.2	1.9	14.2	6.9	7.6	4.2	1.6	0.7	1.0	6.9
22	8.5	2.1	2.8	1.9	12.6	6.8	7.0	3.4	8.0	0.6	1.0	6.2
23	6.2	2.2	2.4	1.9	12.0	6.4	6.5	7.1	8.5	0.7	0.9	5.2
24	8.6	2.0	3.0	1.9	11.4	5.8	5.9	7.0	6.2	0.8	0.8	5.0
25	11.0	1.5	3.7	1.9	10.9	5.3	5.2	6.0	5.0	2.8	0.8	3.9
26	10.7	1.8	3.2	1.9	12.3	4.9	4.7	8.8	4.2	1.5	0.8	4.2
27	10.9	2.1	2.8	1.9	12.4	4.4	4.4	8.9	3.6	1.0	0.8	3.8
28	11.9	2.1	2.5	1.9	11.7	4.1	4.0	6.9	3.2	0.8	0.8	3.2
29	12.2	2.1	2.0	1.9	-------	3.7	3.8	5.6	2.7	‡0.6	1.0	3.0
30	12.5	1.6	1.8	1.9	-------	3.5	3.7	5.6	2.5	1.6	1.2	2.7
31	12.3	-------	1.8	1.8	-------	3.3	-------	5.3	-------	1.4	1.2	-------

NOTES—*Gage heights affected by ice December 8, 1917, to March 2, 1918. ††Estimated. †Maximum 14.6 feet from hydrograph at 5 a. m. ‡Minimum 0.5 foot.

OHIO BASIN—STATION NO. 2

CONEWANGO CREEK AT FREWSBURG, N. Y.

DESCRIPTION OF STATION

Location—At Whitman's Bridge, a single span, steel, through truss, highway bridge, about one mile above Frewsburg, Chautauqua County N. Y.

Records Available—Discharge measurements and gage heights from November 1, 1909, to September 30, 1918.

Drainage Area—690 square miles.

Gage—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge and is read once daily by Joyce Hobart.

Channel—The right bank is a wide, low meadow; both banks overflow during high stages and the bed is composed of clay and gravel.

Discharge Measurements of Conewango Creek at Frewsburg, Chautauqua County, N. Y.
(Drainage area, 690 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
17	Mar. 15	Wilson & McLaughlin	2,359	12.17	4,187	Surface method
18	Mar. 20	Wilson & McLaughlin	1,606	7.39	2,658	Multiple point method
19	Mar. 27	Wilson & McLaughlin	1,777	8.56	3,320	Multiple point method
20	April 26	Wilson	942	3.16	827	Multiple point method
21	May 15	Wilson	894	2.77	693	0.2 & 0.8 method
22	Aug. 1	Wilson	833	2.03	500	0.2 & 0.8 method
23	Dec. 29	Wilson	884	3.41	649	Under ice cover

Daily Mean Gage Heights, in feet, of Conewango Creek at Frewsburg, Chatauqua County, N. Y., for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.69	1.32	7.00	5.17	6.78	9.62	7.61	2.84	6.72	3.70	2.03	1.47
2	0.65	1.45	5.08	4.95	-------	8.10	8.49	3.09	6.97	5.69	1.78	1.20
3	0.59	1.52	2.77	4.59	5.16	5.66	9.16	3.07	6.39	††5.35	2.08	1.45
4	0.55	1.47	3.30	4.16	4.87	4.77	8.86	2.92	4.74	3.97	1.68	1.78
5	0.49	1.40	3.30	8.26	4.44	4.30	7.32	3.66	4.65	3.30	1.56	1.38
6	0.43	1.33	‖3.32	10.27	4.15	4.21	7.33	5.66	9.23	2.94	1.46	1.08
7	††0.42	1.32	3.35	10.33	3.91	3.98	8.40	5.66	9.86	2.69	1.37	1.58
8	††0.46	1.31	2.79	9.89	3.74	4.38	8.41	4.67	10.03	3.67	1.26	0.90
9	0.51	1.31	2.60	8.29	3.44	4.59	7.33	4.47	10.12	4.09	1.10	0.96
10	0.58	1.40	3.27	6.49	3.36	4.21	6.68	3.97	9.45	4.44	1.18	0.86
11	0.68	1.50	3.00	5.03	3.28	7.55	5.80	3.44	8.27	4.87	1.15	0.80
12	0.65	1.50	2.91	4.49	3.16	10.61	5.53	3.20	6.97	5.37	1.13	0.68
13	0.70	1.48	‖2.90	4.61	5.06	11.40	5.89	3.09	5.87	4.77	1.03	0.63
14	1.31	1.50	2.90	4.29	2.99	11.90	5.63	2.85	4.95	7.09	0.84	0.57
15	1.31	1.55	*2.77	*4.25	3.04	†12.12	4.88	2.72	4.49	7.14	1.86	0.51
16	1.30	1.71	2.50	4.22	2.92	11.63	4.52	2.52	4.00	5.72	1.80	0.43
17	1.20	1.76	2.77	-------	2.77	10.82	4.33	2.42	3.80	4.19	0.84	0.38
18	1.30	1.65	2.70	3.84	2.94	10.20	4.07	2.47	3.42	3.67	0.97	0.34
19	1.30	1.80	2.60	3.71	3.04	8.96	3.98	2.57	3.27	3.47	0.78	0.30
20	2.10	1.82	2.58	3.66	3.74	7.35	4.58	2.62	3.12	3.34	0.68	0.26
21	2.31	2.00	2.55	3.64	3.90	7.28	4.38	3.20	2.86	3.33	0.74	0.23
22	2.30	2.17	2.47	-------	3.99	7.26	3.99	3.86	2.77	5.46	0.63	0.21
23	1.87	2.05	2.50	4.21	3.86	7.61	3.68	5.37	2.65	4.20	0.98	0.20
24	1.48	5.52	2.78	4.48	4.89	9.33	3.42	5.57	4.47	3.27	2.10	‡0.19
25	1.41	5.62	2.98	4.09	5.74	9.79	3.24	7.00	6.42	3.53	2.00	0.19
26	1.43	4.70	3.05	3.85	6.23	9.62	3.16	6.39	5.65	2.92	1.43	0.19
27	1.41	2.60	3.50	3.50	9.16	8.51	3.13	5.75	6.49	4.47	1.06	0.20
28	1.38	3.60	6.98	3.71	9.83	8.08	2.96	7.32	5.75	3.80	0.84	0.22
29	1.37	7.02	7.64	3.79	-------	8.38	2.86	8.80	4.69	2.77	0.93	0.28
30	1.34	7.73	6.77	4.19	-------	8.41	2.81	8.21	4.27	2.52	1.65	0.38
31	1.30	-------	5.68	5.99	-------	7.35	-------	8.47	-------	2.29	2.00	-------

NOTES—*Creek frozen December 15, 1916, to January 6, 1917, and January 15 to February 27, 1917, inclusive. †Maximum 12.2 feet at 2 a. m. estimated from hydrograph. ‡Minimum 0.19 feet September 24-26, 1917, inclusive. ‖Interpolated. ††Estimated.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.42	13.25	3.88	2.82	1.88	11.49	3.78	2.41	1.96	2.31	1.26	0.73
2	0.48	12.78	5.08	2.62	1.89	10.64	3.71	2.37	1.93	2.64	1.98	0.51
3	0.58	12.15	3.90	2.49	1.79	10.01	3.82	2.24	1.73	2.03	0.82	0.51
4	0.78	10.42	3.58	2.41	1.78	8.01	3.63	2.15	1.55	1.63	0.81	0.66
5	1.87	††9.3	3.14	2.29	1.77	7.73	3.40	2.07	1.36	‖1.46	0.87	0.51
6	2.16	8.49	2.90	2.29	1.76	8.71	‖3.24	2.00	1.68	1.30	0.85	1.11
7	1.98	5.58	2.58	2.29	1.89	9.22	3.08	2.02	1.59	1.30	0.76	1.09
8	1.53	5.08	2.41	2.19	1.87	9.30	2.99	1.98	1.73	1.10	0.91	1.06
9	1.45	4.58	2.32	2.11	1.94	9.30	2.90	2.05	1.43	1.04	0.91	1.03
10	1.40	4.31	*	2.17	2.09	10.24	3.40	1.98	1.20	1.22	1.05	0.81
11	1.19	‖4.67	2.53	2.14	2.62	10.19	3.47	2.84	1.04	1.37	0.95	0.73
12	1.07	3.83	2.68	2.14	5.01	9.70	3.50	2.50	2.85	1.59	0.81	0.70
13	0.98	3.68	2.73	2.17	9.45	9.60	3.55	3.50	2.73	1.60	0.76	0.88
14	1.16	3.28	2.73	2.10	10.43	13.69	3.83	4.68	2.41	1.36	0.72	1.01
15	1.90	3.21	-------	2.13	11.38	†14.74	4.90	3.80	††2.1	1.17	0.70	1.11
16	2.58	3.18	2.58	2.07	11.9	14.07	4.40	3.27	1.32	1.08	0.61	1.11
17	3.50	3.19	2.57	3.06	12.25	13.39	3.98	2.83	1.49	1.01	0.56	1.91
18	5.28	3.08	2.56	2.04	11.48	12.49	4.40	2.52	1.31	1.01	‖0.46	1.51
19	4.68	3.09	2.52	2.01	10.80	11.80	4.60	2.21	1.13	1.80	0.36	1.06
20	4.08	2.93	2.63	1.99	12.54	9.27	3.60	2.34	1.03	1.81	‖0.22	2.11
21	3.28	2.88	2.98	1.99	13.33	7.60	3.32	2.20	1.98	0.62	0.29	2.91
22	1.88	3.06	-------	1.97	12.88	6.88	3.56	3.10	2.88	0.71	0.26	‖3.01
23	2.85	3.87	-------	1.90	12.18	6.20	4.00	2.66	2.81	0.63	‖0.31	3.11
24	3.06	††3.9	2.28	1.97	11.29	5.80	4.11	3.21	2.14	0.65	0.36	3.03
25	7.62	3.28	2.28	1.98	9.70	5.24	3.64	‖3.66	1.80	0.74	0.39	2.91
26	8.80	3.03	5.64	1.98	10.85	4.92	3.24	2.90	1.58	1.08	0.16	2.84
27	9.63	2.78	4.75	1.94	11.07	4.78	3.00	4.54	1.46	0.88	0.17	2.51
28	10.40	2.80	4.68	1.92	11.28	4.48	2.88	4.70	1.35	0.81	‡0.14	2.06
29	10.90	2.88	3.41	1.94	-------	4.28	2.68	3.43	1.31	0.81	0.47	1.91
30	12.65	3.80	3.28	1.90	-------	4.05	2.54	2.50	1.81	1.02	0.83	2.06
31	13.49	-------	-------	1.89	-------	4.00	-------	2.00	-------	1.47	0.83	-------

NOTES—*Gage heights affected by ice December 10, 1917 to March 8, 1918. ††Estimated. ‖Interpolated. †Maximum 15.2 feet from hydrograph at 4 a. m. ‡Minimum 0.14 foot.

OHIO BASIN—STATION NO. 3

BROKENSTRAW CREEK AT YOUNGSVILLE

DESCRIPTION OF STATION

Location—At single span, steel, through truss, highway bridge at Youngsville, Warren County, about 3 miles above the mouth.

Records Available—Discharge complete from November 1, 1909, to September 30, 1915, and discharge measurements and gage heights from October 1, 1915, to September 30, 1918.

Drainage Area—290 square miles.

Gage—A standard chain gage, whose elevation of zero is 1,188.92 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by E. D. Barton.

Channel—The right bank is high and does not overflow, while the left bank overflows at high stages for a short distance under approach trestle. The bed is composed of clay and gravel, the section is deep and the current sluggish.

Remarks—At gage height approximately 10 feet water leaves the regular creek channel about one-fourth mile above the gaging station and discharges through a flood channel to the west.

Discharge Measurements of Brokenstraw Creek at Youngsville, Warren County
(Drainage area, 290 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq.ft.	Feet	Sec.-ft.	
20	Mar. 15	Wilson & McLaughlin,	747	3.80	2,345	Surface method
21	Mar. 19	Wilson & McLaughlin,	605	2.36	1,115	Multiple point method
22	Mar. 26	Wilson & McLaughlin,	629	2.58	1,223	Multiple point method
23	April 25	Wilson,	440	0.73	329	0.6 method
24	May 12	Wilson,	501	1.44	606	0.2 & 0.8 method
25	May 15	Wilson,	450	0.86	360	0.2 & 0.8 method
26	May 23	Wilson,	665	2.97	1,679	Surface method
27	July 31	Wilson,	378	0.33	178	0.2 & 0.8 method
	1918					
28	Feb. 23	Wilson & Shade,	548	2.31	1,136	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Brokenstraw Creek at Youngsville, Warren County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.30	0.05	3.35	1.36	2.71	2.96	1.96	0.57	5.47	1.67	0.32	0.20
2	0.25	0.05	2.25	1.26	2.09	1.91	2.29	0.84	2.82	3.72	0.27	0.14
3	0.25	0.05	1.45	1.31	1.06	1.46	2.43	0.92	2.10	2.87	0.22	0.30
4	0.25	0.05	1.15	1.61	1.21	1.31	1.83	1.12	1.70	1.47	0.17	0.24
5	0.20	0.05	1.50	3.33	1.11	0.81	1.56	2.52	1.37	0.84	0.17	0.12
6	0.20	0.05	1.48	4.31	0.76	0.66	2.39	3.12	1.57	0.77	0.17	0.07
7	0.15	0.05	1.05	4.11	0.71	0.86	2.56	3.50	4.67	0.74	0.12	0.07
8	0.15	0.05	0.85	3.11	0.61	1.39	2.49	3.17	3.72	1.17	0.12	0.07
9	0.10	0.50	1.10	1.69	0.69	1.56	1.96	2.67	2.50	2.72	0.12	0.07
10	0.10	0.48	1.25	1.46	2.01	1.23	1.33	2.64	2.42	3.44	0.12	0.07
11	0.10	0.40	0.95	1.11	2.11	4.51	1.23	1.94	2.70	5.82	0.07	0.02
12	0.05	0.35	0.90	0.71	2.11	6.26	1.21	1.47	2.17	4.67	0.07	0.02
13	0.25	0.32	0.80	0.61	2.11	4.56	1.13	1.14	1.37	3.32	0.02	0.02
14	0.28	0.30	*0.45	*0.01	2.11	4.79	1.01	0.94	1.10	2.57	0.10	—0.03
15	0.20	0.40	0.68	0.51	2.11	3.79	0.93	0.82	0.92	3.12	0.12	—0.08
16	0.12	0.40	0.60	0.51	2.01	2.91	0.76	0.72	0.77	2.27	0.12	—0.08
17	0.05	0.40	0.52	0.51	1.91	3.31	0.66	0.64	0.67	1.50	0.07	—0.08
18	0.22	0.40	0.50	0.51	1.71	3.26	0.66	0.77	0.62	1.34	0.07	—0.13
19	0.48	0.40	0.50	0.31	0.96	2.46	1.51	1.02	0.57	1.50	0.02	—0.13
20	0.38	0.40	0.52	0.26	0.93	1.99	1.96	2.24	0.50	1.67	0.02	—0.08
21	0.28	0.35	0.55	0.31	0.91	2.26	1.71	2.07	0.42	1.84	0.02	—0.13
22	0.20	0.25	0.65	0.81	0.91	2.26	1.41	2.42	0.32	1.24	0.02	—0.18
23	0.15	0.25	0.40	1.11	1.06	2.43	1.01	2.90	0.20	1.02	0.37	—0.18
24	0.10	2.40	0.45	1.11	2.01	4.26	0.89	2.67	1.40	0.72	0.32	—0.18
25	0.02	2.15	0.50	1.01	1.96	3.66	0.76	3.17	0.80	0.62	0.24	—0.18
26	0.10	2.00	0.50	0.81	2.36	2.75	0.96	2.87	3.00	0.60	0.07	—0.18
27	0.05	2.10	1.30	0.73	3.96	2.23	0.81	2.52	†5.97	0.72	—0.23	—0.13
28	0.05	2.10	3.05	0.61	3.61	2.31	0.76	3.12	4.37	0.57	‡—0.28	—0.13
29	0.05	3.65	2.75	0.59	-------	2.56	0.69	4.34	3.22	0.44	0.10	—0.08
30	0.05	4.15	2.52	1.21	-------	2.41	0.61	4.27	2.47	0.37	0.47	-------
31	0.05	-------	1.68	1.86	-------	1.96	-------	2.70	-------	0.32	0.24	-------

NOTES—*Creek frozen December 14 to 28, 1916 and January 14 to February 24, 1917, inclusive. †Maximum 7.70 feet at 1:00 a. m. estimated from hydrograph. ‡Minimum —0.48 feet at 9:00 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	—0.08	3.27	1.17	0.61	0.16	4.71	0.49	0.38	0.40	1.00	0.25	—0.20
2	—0.03	2.17	1.34	0.61	0.11	3.29	0.46	0.25	0.40	0.92	0.00	—0.20
3	—0.03	1.52	1.14	0.61	0.11	2.83	0.63	0.20	0.40	0.82	—0.10	—0.20
4	0.24	1.32	0.70	0.61	0.11	2.43	0.73	0.48	0.40	0.72	—0.20	0.00
5	0.34	1.22	0.60	0.61	0.11	2.73	0.63	0.50	0.30	0.58	—0.20	0.20
6	0.44	1.10	0.52	0.59	0.13	3.89	0.53	0.52	0.30	0.22	—0.20	0.30
7	0.32	1.00	0.34	0.53	0.16	3.59	0.46	0.48	0.30	0.00	—0.20	0.25
8	0.24	0.87	*	0.66	0.16	2.66	0.81	0.45	0.30	0.00	—0.20	0.20
9	0.17	0.70	0.72	0.61	0.16	2.19	1.09	0.40	0.30	0.00	0.00	0.10
10	0.17	0.62	0.72	0.56	0.16	4.81	1.13	2.08	0.30	0.00	0.00	0.00
11	0.14	0.60	0.70	0.56	0.16	3.29	0.99	1.80	0.30	0.00	0.00	—0.10
12	0.12	0.57	0.62	0.51	0.31	3.89	1.13	1.38	0.30	0.00	0.00	—0.10
13	0.24	0.52	0.62	0.51	3.49	2.69	1.71	3.50	2.20	0.00	—0.10	0.00
14	0.47	0.42	0.67	0.49	2.96	7.49	2.53	2.95	2.40	0.00	—0.10	0.00
15	0.60	0.42	0.67	0.46	5.23	†7.73	2.43	2.12	1.40	0.00	—0.10	0.00
16	0.72	0.47	0.62	0.46	4.36	6.93	1.69	1.35	1.00	—0.50	—0.10	0.00
17	0.67	0.47	0.57	0.29	3.21	2.33	1.51	0.92	1.50	—0.10	—0.10	1.00
18	0.57	0.47	0.52	-------	2.51	1.76	1.56	0.72	1.00	—0.10	—0.20	0.95
19	0.47	0.42	0.42	-------	2.76	1.59	1.49	0.62	0.75	—0.15	—0.20	0.85
20	0.80	0.37	0.50	-------	6.86	1.39	1.70	1.02	0.70	—0.20	—0.20	0.80
21	0.40	0.40	0.84	0.26	5.19	1.26	1.76	1.15	0.70	—0.20	‡—0.30	0.85
22	0.42	0.57	1.00	0.26	3.46	1.02	1.49	0.75	1.10	—0.20	‡—0.30	0.80
23	0.60	0.77	0.84	0.26	2.53	0.99	1.33	0.85	1.40	—0.20	‡—0.30	0.70
24	1.60	0.72	0.64	0.23	1.79	0.89	1.43	0.68	1.60	—0.20	‡—0.30	0.60
25	3.77	0.50	*1.60	0.21	1.63	0.76	1.29	0.58	1.60	0.00	‡—0.30	0.60
26	4.02	0.27	1.50	0.21	3.73	0.73	1.11	‖0.56	1.45	0.30	‡—0.30	0.60
27	3.77	0.18	1.20	0.21	3.43	0.66	1.01	‖0.53	1.40	0.20	‡—0.30	0.60
28	3.87	0.47	0.97	0.16	3.01	0.61	0.89	‖0.51	1.20	0.10	‡—0.30	0.60
29	5.02	0.44	0.62	0.16	-------	0.59	0.76	‖0.48	1.00	0.00	—0.20	0.50
30	5.97	0.52	0.62	0.16	-------	0.53	0.51	‖0.46	0.80	0.10	—0.20	0.50
31	5.47	-------	0.62	0.16	-------	0.51	-------	‖0.43	-------	0.70	—0.20	-------

NOTES—*Gage heights affected by ice December 8 to 22, 1917; December 25, 1917 to February 16, 1918. ‖Interpolated. †Maximum 8.0 feet from hydrograph at 1 a. m. ‡Minimum —0.30 foot.

OHIO BASIN—STATION NO. 4

TIONESTA CREEK AT BUTLER BRIDGE, FOREST COUNTY

DESCRIPTION OF STATION

Location—At three span, highway bridge, about two miles above Nebraska, Forest County.

Records Available—Discharge measurements and gage heights from July 26, 1912, to September 30, 1918.

Drainage Area—420 square miles.

Gage—A standard chain gage, whose elevation of zero is arbitrary, is located on the downstream side of the bridge and is read once daily by Mrs. P. S. Moore.

Channel—Both banks are high, not subject to overflow, and the bed is composed of gravel and boulders.

Discharge Measurements of Tionesta Creek at Butler Bridge, Forest County
(Drainage area, 420 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet.	Sec.-ft.	
7	Mar. 21	Wilson & McLaughlin	617	5.70	1,694	Multiple point method
8	April 27	Wilson	445	4.34	510	Multiple point method
9	May 16	Wilson	475	4.50	587	0.2 & 0.8 method
10	July 24	Wilson	450	4.37	503	0.2 & 0.8 method
11	Aug. 3	Wilson	390	3.88	265	0.2 & 0.8 method
12	Dec. 31	Wilson	348	4.61	199	Under ice cover

Daily Mean Gage Heights, in feet, of Tionesta Creek at Buller Bridge, Forest County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	3.3	3.6	5.0	5.5	8.0	8.1	5.5	4.2	7.0	5.1	††4.2	††3.8
2	3.3	3.5	4.8	5.5	8.2	7.5	5.5	4.2	6.7	5.3	††4.0	††3.6
3	3.3	3.5	4.5	5.5	8.6	7.2	5.3	4.2	6.0	5.1	3.9	††3.7
4	‡3.2	3.5	4.4	5.5	7.2	7.0	5.2	4.3	5.5	4.9	3.8	††3.6
5	3.3	3.5	4.5	5.6	7.2	6.5	5.2	4.8	5.4	4.6	3.7	††3.5
6	‡3.2	3.5	4.5	6.9	7.0	6.3	5.9	5.7	6.2	4.4	3.7	††3.6
7	3.2	3.4	4.3	5.9	7.0	6.7	5.7	5.5	6.2	4.3	3.6	††3.8
8	3.2	3.4	4.2	5.5	6.9	6.7	5.6	5.5	6.5	5.8	3.6	3.9
9	3.3	3.7	4.2	5.2	6.7	6.4	5.3	5.3	6.7	5.0	3.6	3.9
10	3.3	4.1	4.3	5.0	6.7	6.2	5.1	5.6	6.3	5.3	3.6	3.8
11	3.3	4.0	4.2	4.9	6.4	8.4	5.0	5.3	6.6	6.9	3.6	3.7
12	3.3	3.7	4.2	7.2	6.2	†8.4	4.9	5.0	5.8	6.1	3.5	3 6
13	3.4	3.7	4.1	*8.8	6.1	6.3	4.7	4.9	5.4	5.9	3.5	3.6
14	3.7	3.8	*5.8	8.1	6.1	6.4	4.5	4.7	5.0	5 6	4.0	3.6
15	3.6	3.9	5.9	7.8	6.0	6.3	4.5	4.6	4.9	6.5	4.9	3.5
16	3 6	3.9	5.6	7.5	6.0	6.3	4.4	4.5	4.7	5.7	4.5	3.5
17	3.5	3.7	5.6	7.5	5.9	6.2	4.3	4.4	4.6	5.4	3.7	3.5
18	3.5	3.7	5.5	7.6	6.2	6.5	4.2	4.3	4.6	5.2	3.7	3.5
19	3.9	3.6	5.3	7.6	6.4	5.9	4.3	4.7	4.3	5.2	3.6	3.5
20	4.4	3.6	5.2	7.7	6.3	5.6	4.5	5.1	4.1	5.0	3.6	3.5
21	4.6	3.6	5.2	7.7	6.2	5.7	4.6	5.1	4.1	4.8	3.5	3.5
22	4.0	3.6	5.3	8.7	6.1	5.5	4.5	6.0	4.0	4.8	3.5	3.5
23	3.7	3.5	5.3	9.2	6.2	5.7	4.5	6.4	4.0	4.5	4.0	3.4
24	3.6	5.2	5.3	8.4	7.3	7.9	4.4	6.0	4.6	4.4	4.1	3.4
25	3.5	4.7	5.3	8.2	7.5	6.9	4.3	6.0	4.3	4.7	3.8	3.4
26	3.5	4.3	5.2	7.6	7.5	6.5	4.4	5.7	4.1	4.4	3.6	3.4
27	3.5	4.8	5.4	7.4	7.7	6.5	4.3	5.5	6.6	5.4	3.6	3.4
28	3.5	4.7	6.8	7.3	9.1	6.3	4.2	5.8	5.5	††6.2	3.5	3.5
29	3.4	4.7	6.5	7.2	-------	5.9	4.2	6.7	6.1	††5.3	3.5	3.5
30	3.4	5.2	6.0	7.3	-------	5.7	4.2	6.4	5.6	††4.8	3.6	3 5
31	3.5	-------	5.7	7.7	-------	5.5	-------	5.9	-------	††4.5	3.7	-------

NOTES—*Creek frozen December 14, 1916 to January 5, 1917, and January 13 to March 11, 1917, inclusive. †Maximum 10.0 feet at 1 a. m. estimated from hydrograph. ‡Minimum 3.2 feet October 4 and 6 to 8, 1916, inclusive. ††Estimated.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	3.7	7.4	4.1	4.6	4.8	7.8	4.3	4.5	4.3	4.4	3.9	3.6
2	3.7	6.2	4.2	4.6	4.8	7.2	4.3	4.4	4.1	4.4	3.6	3.6
3	3.7	5.7	4.2	4.6	4.7	6.4	4.6	4.3	4.1	4.0	3.6	3 6
4	4.3	5.4	4.2	4.6	4.7	6.2	5.1	4.3	4.0	4.0	3.6	3.6
5	4.3	5.1	4.1	4.6	4.7	6.2	4.7	4.3	3.9	3.8	3.6	3.7
6	4.0	4.9	4.0	4.6	4.7	6.3	4.6	4.3	3.9	3.8	3.6	4 8
7	3.8	4.8	4.0	4.7	5.0	6.6	4.5	4.3	4.0	3.8	3.6	4.0
8	3.8	4.6	4.0	4.7	5 0	6.3	4.7	4.4	4.1	3.6	3.6	4 7
9	3.8	4.5	*4.3	4.8	5 0	6.0	5.0	4.5	3.9	3.6	3.8	3 9
10	3.8	4.4	4.7	4.8	5.1	7.1	4.7	4.6	3.8	3.6	4.2	3.7
11	3.8	4.4	4.8	4.8	5.1	6.5	4.7	4.6	4.0	3.6	4.1	3.8
12	3.8	4.3	4.7	4.9	5.8	6.1	5.0	5.0	4.7	3.6	3.9	3.7
13	4.4	4.2	4.6	4.8	7.1	6.4	4.8	5.7	4.4	3.6	3.8	4.4
14	4.1	4.2	4.4	4.8	7.4	9.8	5.1	6.1	4.1	3.6	3.6	4.5
15	4.2	4.1	4.4	4.8	8.3	9.4	5.0	5.6	4.0	3.4	3.7	4.1
16	4.7	4.1	4.4	4.7	10.4	7.2	4.9	5.3	3.8	3.4	3.7	4.0
17	4.2	4.1	4.4	4.7	9.7	6.5	4.9	5.1	3.8	3.4	3.6	4.6
18	4.2	4.0	4.4	4.8	9.0	6.1	5.1	4.9	3.8	3.4	3.6	4.8
19	5.0	4.0	4.4	4.8	9.6	5.7	5 0	4.7	3.8	3 4	3.5	4.6
20	6.3	4.0	4.4	4.8	†11.1	5.5	4.9	4.7	3.8	3.4	3.5	4 5
21	5.4	4.0	4.5	4.8	8.3	5.4	4.9	4.9	4.1	3.4	3.4	4.5
22	5.0	4.0	4.7	4.8	6.9	5.3	4.9	4.6	7 0	3 4	3.4	4 6
23	4.8	4.1	4.7	4.8	6.8	5.2	4.9	5 9	6 9	3.4	3.4	4.6
24	6 4	4 1	5.1	4.8	6.7	5 1	5 0	4 8	5.0	3.4	3.4	4.4
25	7.4	3.9	5.1	4.8	6.7	4.9	4 8	4.7	4.6	3 4	3.4	4.3
26	7.0	3 9	5.1	4.8	7 0	4.7	4.7	4 8	4.4	4 2	‡3.3	4 2
27	7.3	3.9	5.1	4.8	6.3	4.7	4.7	4.7	4.4	3 8	‡3.3	4.3
28	8.1	4.5	5.0	4.8	6.1	4.6	4.6	4 4	4.2	3.6	3.4	4 2
29	8.1	4.3	4.8	4.8	-------	4.5	4.6	4 3	4.1	3 6	3.5	4 1
30	8.8	4.2	4.7	4.9	-------	4.5	4.6	4.3	4.0	4.2	3.5	4.1
31	8.3	-------	4.6	4.9	-------	4.4	-------	4.3	-------	4.4	3.6	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 19, 1918. †Maximum 11.5 feet from hydrograph at 8 a. m. ‡Minimum 3.3 feet.

OHIO BASIN—STATION NO. 5

OIL CREEK NEAR ROUSEVILLE

DESCRIPTION OF STATION

Location—At two span, steel, through truss, highway bridge, one half mile below Rouseville, Venango County, and two and one half miles above the mouth.

Records Available—Discharge complete from October 20, 1909, to September 30, 1918.

Drainage Area—330 square miles.

Gage—A standard chain gage, whose elevation of zero is arbitrary, is located on the downstream side of the bridge and is read once daily by Mrs. Lena Copeland.

Channel—Right bank overflows in extreme floods; left is high and does not overflow and the bed is composed of gravel.

Discharge Measurements of Oil Creek near Rouseville, Venango County
(Drainage area, 330 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet.	Sec.-ft.	
27	Mar. 27	Wilson & McLaughlin	702	2.41	1,047	Multiple point method
28	April 28	Wilson	510	1.40	286	Multiple point method
29	May 17	Wilson	529	1.44	293	0.2 & 0.8 method
30	July 23	Wilson	525	1.51	329	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Oil Creek near Rouseville, Venango County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.7	0.9	2.3	1.7	------	2.4	2.3	1.3	3.7	1.9	1.0	0.9
2	0.6	0.9	1.9	1.8	2.0	2.1	2.6	1.5	2.7	2.1	1.0	0.9
3	0.6	0.9	1.7	1.8	*	2.0	2.5	1.5	2.2	2.0	1.0	0.9
4	0.6	1.0	1.7	2.2	------	1.8	2.1	1.5	2.1	1.7	0.9	0.8
5	0.6	0.9	1.8	3.8	------	1.1	2.0	2.3	2.0	1.5	0.9	‡0.5
6	0.7	0.8	1.8	4.3	------	1.5	2.7	2.8	2.0	1.4	0.9	0.9
7	0.6	0.8	1.6	3.0	------	1.6	2.7	2.7	4.6	1.5	1.0	0.9
8	0.6	0.7	1.5	2.3	------	2.6	2.7	2.5	2.0	1.7	1.0	0.9
9	0.8	0.7	1.8	2.2	------	2.2	2.3	2.3	3.3	1.6	1.0	0.9
10	0.7	1.5	1.9	2.1	------	2.0	2.1	2.7	3.1	2.4	1.1	0.8
11	0.7	1.1	1.6	1.8	------	3.8	2.0	2.3	3.0	2.9	1.0	0.8
12	0.7	1.1	1.6	1.6	------	†5.1	1.9	2.0	2.4	2.3	0.9	0.8
13	1.0	1.1	1.5	1.5	------	3.1	1.7	1.7	2.0	2.0	1.0	0.7
14	1.0	1.2	*	1.5	------	2.9	1.7	1.7	1.7	2.0	1.2	0.7
15	0.9	1.4	------	*	------	3.2	1.6	1.6	1.7	3.0	1.1	0.7
16	0.9	1.2	------	------	------	2.2	1.6	1.6	1.7	2.1	1.0	0.7
17	0.8	1.1	------	------	------	2.8	1.5	1.4	1.6	2.0	0.9	0.7
18	0.7	1.0	------	------	------	3.0	1.5	1.5	1.5	1.9	0.9	0.7
19	1.3	1.0	------	------	------	2.3	1.6	1.6	1.6	1.8	0.9	0.7
20	1.6	1.1	------	------	------	2.3	1.9	1.8	1.5	1.7	0.8	0.7
21	1.7	1.0	------	------	------	2.5	1.9	2.0	1.4	2.1	0.8	0.7
22	1.3	1.0	------	------	------	2.4	1.7	2.3	1.3	1.7	0.9	0.7
23	1.0	1.1	------	------	------	2.4	1.6	2.8	1.3	1.5	1.5	0.7
24	1.0	2.2	------	------	------	4.0	1.5	2.3	2.1	1.5	1.4	0.7
25	1.0	1.4	------	------	------	3.0	1.5	3.0	1.6	1.3	1.1	0.6
26	0.9	1.2	------	------	------	2.5	1.5	2.3	1.5	1.2	0.9	0.6
27	0.9	1.1	------	------	------	2.2	1.5	2.3	3.7	1.2	0.9	0.6
28	0.8	1.5	------	------	2.9	2.5	1.4	2.6	2.5	1.1	0.9	0.7
29	0.7	3.1	2.7	------	------	2.6	1.4	3.7	2.5	1.1	0.9	0.8
30	0.7	3.3	2.1	------	------	2.4	1.4	2.9	2.2	1.1	1.0	0.8
31	0.8	------	1.9	------	------	2.2	------	2.9	------	1.0	1.0	------

NOTES—*Creek frozen December 14 to 28 1916; January 15 to February 1 and February 3 to 27, 1917, inclusive. †Maximum 5.5 feet estimated from hydrograph. ‡Minimum 0.5 feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.0	2.5	1.8	1.5	1.1	4.4	1.3	1.5	1.3	1.2	1.0	0.9
2	1.0	2.3	1.8	1.5	1.1	3.3	1.3	1.5	1.3	1.0	0.9	0.9
3	1.0	2.0	1.5	1.5	1.1	2.8	1.4	1.4	1.3	1.0	0.8	0.9
4	1.2	1.8	1.5	1.4	1.1	2.3	1.6	1.4	1.2	0.9	0.8	0.9
5	1.2	1.7	1.4	1.4	1.2	3.3	1.5	1.3	1.1	0.9	0.8	1.1
6	1.2	1.6	1.3	1.4	1.1	3.3	1.5	1.4	1.1	0.9	0.8	1.1
7	1.1	1.5	1.2	1.4	1.1	3.0	1.4	1.3	1.3	0.9	0.8	1.0
8	1.0	1.6	1.0	1.4	1.1	2.4	2.1	1.3	1.2	0.9	0.8	0.9
9	1.0	1.6	*1.0	1.4	1.2	2.4	2.3	1.2	1.1	0.8	1.2	0.8
10	0.9	1.5	1.9	1.3	1.3	4.2	1.9	2.0	1.1	0.8	1.0	0.8
11	0.8	1.3	1.9	1.3	1.5	2.9	1.8	2.5	1.0	0.8	0.9	0.8
12	0.9	1.3	1.9	1.4	1.8	2.7	2.1	2.3	1.9	0.8	0.9	0.9
13	1.2	1.2	2.0	1.7	3.4	2.7	2.1	3.9	1.4	0.8	0.9	1.2
14	1.1	1.1	1.9	1.4	3.3	†5.8	2.5	3.2	1.3	0.8	0.9	1.0
15	1.2	1.2	1.8	1.4	5.1	4.8	2.1	2.5	1.2	0.8	0.9	0.9
16	1.2	1.3	1.8	1.5	3.4	3.0	2.0	2.1	1.0	0.8	0.9	1.0
17	1.1	1.2	1.7	1.4	2.7	2.6	1.9	1.9	1.0	0.8	0.8	1.8
18	1.0	1.2	1.7	1.4	2.2	2.4	2.0	1.8	0.9	0.8	0.8	1.4
19	1.6	1.1	1.5	1.3	2.8	2.1	1.9	1.7	0.9	0.8	0.7	1.2
20	2.6	1.2	1.5	1.3	†5.8	1.9	1.7	1.6	0.9	0.8	0.7	1.5
21	2.0	1.2	1.7	1.4	3.7	1.9	1.7	1.9	1.0	0.8	0.7	1.5
22	1.6	1.2	2.0	1.4	2.7	1.9	1.9	1.7	2.1	0.8	0.7	2.0
23	1.6	1.4	1.9	1.5	2.2	1.7	1.9	2.4	1.6	0.8	0.7	1.5
24	3.0	1.4	2.0	1.1	2.2	1.7	2.2	1.9	1.3	1.3	0.7	1.2
25	4.0	1.2	2.5	1.4	2.1	1.7	1.9	1.7	1.2	1.1	0.7	1.2
26	3.3	1.2	2.4	1.3	3.6	1.6	1.8	1.7	1.1	1.2	0.7	1.4
27	3.0	1.1	1.9	1.2	2.8	1.5	1.7	1.5	1.1	1.0	0.7	1.6
28	3.0	1.3	1.8	1.2	2.6	1.5	1.7	1.6	1.0	0.9	0.7	1.6
29	3.1	1.2	1.8	1.2	------	1.4	1.7	1.4	1.0	0.9	0.9	1.3
30	4.8	1.2	1.6	1.2	------	1.4	1.6	1.4	1.1	1.5	0.9	1.2
31	3.6	------	1.5	1.1	------	1.4	------	1.4	------	1.2	0.9	------

NOTES—*Gage heights affected by ice December 9, 1917, to February 15, 1918. †Maximum 6.1 feet from hydrograph at 1 p. m.

Daily Discharge, in second-feet, of Oil Creek near Rouseville, Venango County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	77	118	1,170	495	900	1,320	1,170	255	3,540	675	145	118
2	60	118	675	580	780	900	1,660	353	1,830	900	145	118
3	60	118	495	580	*580	780	1,490	355	1,030	780	145	118
4	60	145	495	1,030	420	580	900	355	900	495	118	96
5	60	118	580	3,720	355	175	780	1,170	780	355	118	‡45
6	77	96	580	4,640	300	355	1,830	2,000	780	300	118	118
7	60	96	420	2,340	280	420	1,830	1,830	5,240	355	145	118
8	60	77	355	1,170	255	1,660	1,830	1,490	780	495	145	118
9	96	77	580	1,030	255	1,030	1,170	1,170	2,850	420	145	118
10	77	355	675	900	235	780	900	1,830	2,510	1,320	175	96
11	77	175	420	580	210	3,720	780	1,170	2,340	2,170	145	96
12	77	175	420	420	192	†6,340	675	780	1,320	1,170	118	96
13	145	175	355	355	175	2,510	495	495	780	780	145	77
14	145	210	*280	355	145	2,170	495	495	495	780	210	77
15	118	300	265	*280	107	2,080	420	420	495	2,340	175	77
16	118	210	255	255	86	1,030	420	420	495	900	145	77
17	96	175	235	235	77	2,000	355	300	420	780	118	77
18	77	145	220	235	132	2,340	355	355	355	675	118	77
19	255	145	220	210	107	1,170	420	420	420	580	118	77
20	420	175	210	192	145	1,170	675	580	355	495	96	77
21	495	145	210	195	160	1,490	675	780	300	900	96	77
22	255	145	203	355	235	1,320	495	1,170	255	495	118	77
23	145	175	195	387	300	1,320	420	2,000	255	255	355	77
24	145	1,030	182	328	675	4,080	355	1,170	900	355	300	77
25	145	300	175	328	900	2,340	355	2,340	420	255	175	60
26	118	210	170	255	1,320	1,490	355	1,170	355	210	118	60
27	118	175	495	210	2,000	1,030	353	1,170	3,540	210	118	60
28	96	355	2,000	192	2,170	1,490	300	1,660	1,490	175	118	77
29	77	2,510	1,830	210	-------	1,660	300	3,540	1,490	175	118	96
30	77	2,850	900	280	-------	1,320	300	2,170	1,030	175	145	96
31	96	-------	675	495	-------	1,030	-------	2,170	-------	145	145	-------

NOTES—*Creek frozen December 14 to 28, 1916; January 15 to February 1 and February 3 to 27, 1917, inclusive, and discharge estimated from climatological data. †Maximum=7,360 second-feet. ‡Minimum=45 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	130	1,480	560	76	40	5,040	230	330	230	190	130	105
2	130	1,170	560	68	40	2,820	230	330	230	130	105	105
3	130	775	330	68	35	1,960	275	275	230	130	85	105
4	190	560	330	68	35	1,170	395	275	190	105	85	105
5	190	470	275	68	35	2,820	330	230	160	105	85	160
6	190	395	230	68	30	2,820	330	275	160	105	85	160
7	160	330	190	68	30	2,300	275	230	230	105	85	130
8	130	395	130	68	30	1,320	900	230	190	105	85	105
9	130	395	*95	68	35	1,320	1,170	190	160	85	190	85
10	105	330	85	68	46	4,600	660	775	160	85	130	85
11	85	230	76	60	68	2,130	560	1,480	130	85	105	85
12	105	230	68	60	105	1,800	900	1,170	660	85	105	105
13	190	190	76	60	230	1,800	900	3,960	275	85	105	190
14	160	160	85	53	560	8,480	1,480	2,640	230	85	105	130
15	190	190	85	53	1,320	5,960	900	1,480	190	85	105	105
16	190	230	76	53	3,000	2,300	775	900	130	85	105	130
17	160	190	68	53	1,800	1,640	660	660	130	85	85	560
18	130	190	68	53	1,030	1,320	775	560	105	85	85	275
19	395	160	68	53	1,960	900	660	470	105	85	68	190
20	1,640	190	68	53	†8,480	660	470	395	105	85	68	330
21	775	190	85	53	3,550	660	470	660	130	85	68	330
22	395	190	117	53	1,800	660	660	470	900	85	68	775
23	395	275	145	46	1,030	470	660	1,320	395	85	68	330
24	2,300	275	160	46	1,030	470	1,030	660	230	230	68	230
25	4,170	190	275	46	900	470	660	470	190	160	68	190
26	2,820	190	210	40	3,360	395	560	470	160	190	68	275
27	2,300	160	160	40	1,960	330	470	330	160	130	68	395
28	2,300	230	117	40	1,640	330	470	395	130	105	68	395
29	2,470	190	95	40	-------	275	470	275	130	105	105	230
30	5,960	190	85	40	-------	275	395	275	160	330	105	190
31	3,360	-------	76	40	-------	275	-------	275	-------	190	105	-------

NOTES—*Gage heights affected by ice December 9, 1917, to February 15, 1918, and discharge estimated from climatological data. †Maximum 9,320 second-feet from hydrograph at 1 p. m.

Estimated Monthly Discharge of Oil Creek near Rouseville, Venango County
(Drainage area, 330 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	495	60	128	0.39	0.45
November	2,850	77	370	1.12	1.25
December	----------	----------	514	1.56	1.80
January	4,640	----------	737	2.23	2.57
February	----------	----------	482	1.46	1.52
March	†6,340	175	1,670	5.06	5.83
April	1,850	360	752	2.28	2.54
May	3,540	255	1,150	3.48	4.01
June	5,240	255	1,260	3.82	4.26
July	2,340	145	652	1.98	2.28
August	355	96	148	0.45	0.52
September	118	‡45	88	0.27	0.30
The year	6,340	----------	664	2.01	27.33

NOTES—Creek frozen December 14 to 28, 1916; January 15 to February 1 and February 3 to 27, 1917, inclusive, and discharge estimated from climatological data. †Maximum=7,360 second-feet, March 12, 1917. ‡Minimum=45 second-feet, September 5, 1917.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	5,960	85	1,030	3.12	3.60
November	1,480	160	345	1.05	1.17
December	560	----------	163	0.49	0.56
January	----------	----------	56	0.17	0.20
February	8,480	----------	1,220	3.70	3.85
March	8,480	275	1,860	5.64	6.50
April	1,480	230	624	1.89	2.11
May	3,960	190	724	2.19	2.52
June	900	105	220	0.67	0.75
July	330	85	119	0.36	0.42
August	196	68	92	0.28	0.32
September	775	85	220	0.67	0.75
The year	8,480	----------	553	1.68	22.75

NOTES—Gage heights affected by ice December 9, 1917, to February 15, 1918, and discharge estimated from climatological data. Maximum 9,320 second-feet February 20.

OHIO BASIN—STATION NO. 6

FRENCH CREEK AT KIMMEYTOWN

DESCRIPTION OF STATION

Location—At single span, steel, through truss, highway bridge at Kimmeytown, Erie County, 5 miles above Leboeuf.

Records Available—Discharge complete from May 16, 1910, to September 30, 1916, and discharge measurements and gage heights from October 1, 1916, to September 30, 1918. For other records on this creek see French Creek at Carlton.

Drainage Area—207 square miles. Prior to October 1, 1915, a drainage area of 190 square miles was used in all calculations, but additional topographic sheets and highway maps, not available at the time original computations were made, have been used in revising the area to 207 square miles. Therefore all previously published run-off at this station should be corrected for the new figure.

Gage—A standard chain gage, whose elevation of zero is 1,235.7 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by Mrs. J. L. Carter.

Channel—Both banks are subject to overflow at extreme stages; the bed is composed of gravel.

Remarks—Data at this station previous to October 1, 1914, has been published under North Branch French Creek at Kimmeytown

Discharge Measurements of French Creek at Kimmeytown, Erie County
(Drainage area, 207 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
17	Mar. 14	Wilson & McLaughlin	673	4.96	1,582	Surface method
18	Mar. 19	Wilson & McLaughlin	380	3.11	754	Multiple point method
19	Mar. 26	Wilson & McLaughlin	404	3.11	729	Multiple point method
20	April 25	Wilson	153	1.53	164	Multiple point method
21	May 12	Wilson	227	2.05	322	0.2 & 0.8 method
22	May 23	Wilson	456	3.71	957	0.2 & 0.8 method
23	July 30	Wilson	97	1.00	80	0.6 method
24	Sept. 28	Wilson	38	0.70	24	Wading 75 ft. below bridge
25	Dec. 27	Wilson	451	4.21	390	Under partial ice cover

Daily Mean Gage Heights, in feet, of French Creek at Kimmeytown, Erie County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	††0.7	1.3	3.0	-------	-------	-------	††3.1	1.4	3.3	††4.0	1.0	1.0
2	0.7	1.7	2.3	-------	-------	-------	4.2	1.7	3.0	4.2	0.9	††1.0
3	0.6	1.4	††2.1	-------	-------	-------	4.0	1.9	††2.5	3.4	0.9	1.2
4	0.6	1.2	1.9	-------	-------	-------	3.0	1.6	2.2	2.3	0.9	††1.1
5	0.6	††1.2	2.3	-------	-------	-------	2.4	2.1	2.2	1.7	††0.9	0.9
6	0.6	1.0	2.3	-------	-------	-------	3.1	††4.0	2.2	1.4	0.9	1.1
7	0.7	0.9	2.0	††4.8	-------	-------	3.5	3.7	4.6	1.4	0.9	1.1
8	††0.7	0.8	1.8	3.5	-------	-------	††3.2	3.3	3.7	††1.7	0.8	1.0
9	0.7	0.8	2.0	3.8	-------	-------	3.0	2.7	2.6	2.5	0.8	††1.0
10	0.7	1.2	††2.2	2.5	-------	-------	2.4	3.3	††3.0	3.2	0.9	1.1
11	‡0.5	1.6	2.0	*	-------	-------	2.3	2.9	3.0	7.8	0.8	1.0
12	0.7	††1.3	1.9	-------	-------	†9.1	2.9	2.1	2.3	6.4	††0.8	0.9
13	0.7	1.2	1.7	-------	-------	4.6	2.7	††1.9	1.9	3.7	0.8	0.8
14	1.8	1.4	2.7	-------	-------	5.0	2.2	1.7	1.8	3.6	0.8	0.8
15	††2.2	1.6	*	-------	-------	5.0	††2.1	1.5	1.7	††3.0	0.8	0.9
16	1.1	††1.9	-------	-------	-------	3.6	2.0	1.4	1.5	2.3	0.8	0.8
17	0.9	1.6	-------	-------	-------	3.9	1.9	1.3	††1.4	1.9	0.8	0.7
18	0.9	1.6	-------	-------	-------	††4.1	1.7	1.3	1.3	2.0	0.8	0.7
19	0.9	††1.8	-------	-------	-------	3.1	3.0	2.1	1.3	1.9	††0.8	0.8
20	2.0	2.1	-------	-------	-------	3.0	2.8	††3.2	1.2	1.7	0.8	0.7
21	2.0	2.4	-------	-------	-------	3.4	2.3	2.8	1.2	1.8	0.8	0.8
22	††1.6	2.1	-------	-------	-------	3.2	††2.1	2.8	1.1	††1.7	0.7	††0.8
23	1.3	1.8	-------	-------	-------	3.4	1.9	3.7	1.1	1.4	0.9	††0.7
24	1.1	4.0	-------	-------	-------	5.0	1.6	3.4	††2.1	1.9	1.0	0.6
25	1.0	3.8	-------	-------	-------	††4.5	1.5	5.2	1.9	1.4	0.9	0.6
26	0.9	††2.9	-------	-------	-------	3.1	1.5	3.9	1.7	1.3	††0.9	0.7
27	1.0	2.3	-------	-------	-------	2.8	1.5	††3.6	6.0	1.2	0.9	0.7
28	1.0	2.3	-------	-------	-------	3.0	1.5	4.5	3.9	1.1	0.8	0.7
29	††0.9	4.0	-------	-------	-------	3.4	††1.5	5.9	3.9	††1.0	1.4	0.7
30	0.9	3.9	-------	-------	-------	3.4	1.4	4.5	3.1	1.0	1.4	-------
31	0.9	-------	-------	-------	-------	2.7	-------	3.4	-------	1.0	1.3	-------

NOTES—*Creek frozen December 15, 1916 to January 6, 1917, and January 11 to March 11, 1917 inclusive. †Maximum 10.7 feet at 1 a. m. estimated from hydrograph. ‡Minimum 0.5 feet. ††Estimated from hydrograph.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.9	4.0	2.7	2.7	1.5	7.9	1.4	1.3	1.0	2.6	1.4	0.7
2	0.8	3.0	2.4	2.4	1.5	7.3	1.4	1.3	1.2	2.2	1.0	0.7
3	0.8	3.2	1.8	2.0	1.5	7.0	1.7	1.3	1.1	1.3	0.9	0.8
4	1.4	††3.0	1.7	1.4	1.5	6.7	1.6	1.2	0.9	1.2	0.9	0.8
5	1.9	2.6	1.5	1.3	1.5	6.3	1.3	1.3	0.9	1.0	1.0	1.0
6	1.6	2.4	1.4	1.7	1.4	5.8	1.3	1.3	0.9	0.9	0.8	1.1
7	‖1.5	2.3	1.4	1.7	1.3	4.1	1.3	1.3	1.1	0.9	0.8	1.1
8	1.4	2.0	1.1	1.6	1.4	3.4	2.2	1.6	1.1	0.9	1.0	1.0
9	1.1	1.9	*	1.7	1.6	3.1	2.4	1.5	1.0	0.9	0.8	0.9
10	1.0	1.7	-------	1.6	1.8	5.8	1.9	1.5	1.0	1.2	0.8	0.8
11	1.0	††1.6	1.4	1.6	2.2	4.5	1.8	1.7	0.9	1.7	0.8	0.8
12	1.0	1.6	1.4	-------	2.8	4.0	2.2	1.9	3.0	1.4	0.8	0.8
13	1.2	1.6	1.3	1.5	7.1	4.6	2.6	4.4	2.5	1.2	0.8	0.9
14	‖1.4	1.5	1.2	1.6	7.7	†9.9	3.6	3.9	1.8	1.0	0.7	1.0
15	1.6	1.4	1.2	1.5	13.8	6.8	2.7	2.7	1.6	0.9	0.7	0.9
16	1.8	1.4	1.1	1.5	9.9	4.1	2.2	1.9	1.3	0.9	0.7	1.0
17	1.5	1.5	1.1	1.6	8.6	3.1	2.5	1.6	1.1	0.8	0.7	1.9
18	1.3	1.5	1.0	1.7	8.0	2.9	3.0	1.4	1.0	0.8	‡0.6	1.7
19	2.0	1.5	1.0	1.7	7.8	2.6	2.7	1.3	1.0	0.8	‡0.6	1.4
20	4.5	1.5	1.3	1.7	15.8	2.4	2.0	1.2	0.9	0.7	‡0.6	1.8
21	3.6	1.4	1.4	1.7	11.0	2.3	1.8	1.2	1.0	0.7	‡0.6	2.3
22	2.3	1.6	2.0	1.7	8.7	2.3	2.3	1.2	2.2	0.7	0.7	2.3
23	1.9	2.3	1.9	1.7	7.8	2.0	2.4	1.4	2.3	0.7	‡0.7	1.8
24	3.0	2.0	1.9	1.6	6.4	1.8	2.4	1.2	1.7	0.9	‡0.6	1.4
25	6.7	1.6	5.1	1.6	6.3	1.7	2.0	1.2	1.3	1.3	‡0.6	1.9
26	5.7	1.5	5.0	1.5	9.6	1.6	1.8	1.2	1.2	1.7	‡0.6	2.0
27	3.9	1.4	4.2	1.6	8.9	1.5	1.7	1.1	1.0	1.1	‡0.6	1.5
28	††4.1	1.4	4.0	1.5	8.0	1.5	1.6	1.0	1.0	1.0	‡0.7	1.4
29	5.4	1.4	3.3	1.5	-------	1.4	1.5	0.9	0.9	0.9	0.7	1.1
30	8.6	1.5	3.2	1.5	-------	1.4	1.4	1.0	0.9	2.6	0.7	1.1
31	5.8	-------	3.1	1.4	-------	1.4	-------	1.3	-------	2.1	0.8	-------

NOTES—*Gage heights affected by ice December 9, 1917 to March 3, 1918. ‖Interpolated. ††Estimated. †Maximum 10.5 feet from hydrograph at 8 p. m. ‡Minimum 0.6 foot.

OHIO BASIN—STATION NO. 7

CUSSEWAGO CREEK NEAR MEADVILLE

DESCRIPTION OF STATION

Location—At single span, steel, through truss, highway bridge, four and one half miles above Meadville, Crawford County.

Records Available—Discharge complete from May 3, 1910, to September 30, 1918.

Drainage Area—88 square miles.

Gage—A standard chain gage, whose elevation of zero is 1,071.77 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by Samuel LeFever.

Channel—Both banks are subject to overflow at gage height of approximately 8 feet, and the bed is not permanent.

Discharge Measurements of Cussewago Creek near Meadville, Crawford County
(Drainage area, 88 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq.ft.	Feet	Sec.-ft.	
18	Mar. 13	Wilson & McLaughlin,	719	9.59	962	Multiple point method 139 sec.-ft. overflow
19	Mar. 17	Wilson & McLaughlin,	406	7.79	482	Multiple point method
20	Mar. 24	Wilson & McLaughlin,	250	5.92	239	Multiple point method
21	April 24	Wilson,	55	2.53	45	Multiple point method
22	May 11	Wilson,	140	4.28	129	0.2 & 0.8 method
23	May 22	Wilson,	140	4.28	138	0.2 & 0.8 method
24	July 28	Wilson,	30	1.88	25	0.6 method
25	Sept. 29	Wilson,	5	0.80	3	Wading 5 ft. below bridge 0.6 method.
26	Dec. 28	Wilson,	85	3.72	79	Under ice cover

Daily Mean Gage Heights, in feet, of Cussewago Creek near Meadville, Crawford County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.79	1.34	-7.5	------	------	------	4.2	2.1	7.5	4.0	1.25	1.6
2	0.84	1.5	6.5	------	------	------	6.2	2.3	7.8	3.9	1.20	1.4
3	0.84	1.44	4.2	------	------	------	7.3	2.4	5.5	5.7	1.10	1.25
4	0.79	1.34	3.2	------	------	------	7.3	2.1	4.0	3.9	1.05	1.20
5	0.74	1.29	3.9	------	------	------	5.0	3.2	3.2	2.5	1.00	1.15
6	0.69	1.19	5.1	------	------	------	4.5	6.6	3.1	2.0	1.00	1.20
7	0.64	1.14	4.2	------	------	------	6.4	6.7	5.5	1.7	0.95	††1.20
8	‡0.54	1.14	3.1	------	------	------	7.0	6.3	6.8	2.6	0.95	††1.10
9	0.64	1.24	5.2	------	------	------	7.3	5.4	6.9	3.6	0.90	††1.30
10	0.69	1.44	4.4	------	------	------	6.0	4.6	8.1	4.2	0.90	1.25
11	0.79	1.5	4.4	------	------	------	4.5	4.3	8.0	7.2	0.85	1.10
12	0.89	1.5	3.3	------	------	†	4.6	3.0	8.9	7.8	0.85	1.05
13	0.89	1.5	2.9	------	------	9.6	4.8	2.8	6.9	8.2	0.85	0.95
14	1.8	1.8	3.1	------	------	8.8	3.9	2.6	3.5	††6.7	1.05	0.90
15	1.9	2.5	*	------	------	8.0	3.3	2.3	3.4	5.0	1.00	0.85
16	1.9	2.6	------	------	------	8.6	3.1	2.0	2.9	4.6	1.00	0.85
17	1.5	2.3	------	------	------	7.8	3.0	1.9	2.5	3.7	1.10	0.80
18	1.44	2.2	------	------	------	7.0	2.7	1.8	2.3	3.7	0.90	0.80
19	1.6	2.1	------	------	------	6.9	3.9	1.9	2.2	4.2	0.85	0.70
20	2.2	2.4	------	------	------	5.1	4.6	2.8	2.1	3.4	0.85	0.75
21	3.1	2.9	------	------	------	5.3	4.9	5.1	2.0	3.3	0.80	0.75
22	2.8	2.9	------	------	------	5.4	3.5	4.3	1.8	3.5	0.80	0.80
23	2.2	2.4	------	------	------	5.6	2.9	4.8	1.6	3.0	1.40	0.80
24	1.9	3.9	------	------	------	5.8	2.5	5.3	2.3	2.3	1.35	0.85
25	1.6	5.4	------	------	------	7.1	2.3	5.3	2.4	1.9	1.6	0.80
26	1.5	4.1	------	------	------	6.5	2.3	7.1	2.1	4.2	1.5	0.80
27	1.34	3.7	------	------	------	4.1	2.8	7.7	3.2	2.4	1.3	0.75
28	1.29	4.4	------	------	------	3.8	2.5	7.0	6.7	1.9	1.1	0.80
29	1.24	6.8	------	------	------	4.4	2.3	7.8	6.6	1.7	2.1	0.80
30	1.24	7.5	------	------	------	5.2	2.1	8.4	5.3	1.45	2.9	0.80
31	1.14	------	------	------	------	4.7	------	8.9	------	1.25	2.4	------

NOTES—*Creek frozen December 15, 1916 to March 12, 1917, inclusive. †Maximum 11.1 feet at 11:00 a. m. estimated from hydrograph. ‡Minimum 0.54 feet. ††estimated.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.99	9.1	5.3	2.0	2.0	8.7	1.9	2.3	1.16	0.85	1.10	0.75
2	0.99	8.1	*6.1	2.0	2.0	8.8	1.8	2.1	1.11	0.95	0.80	0.55
3	1.19	6.3	5.4	1.9	2.0	8.6	2.0	2.0	1.16	0.95	0.65	0.55
4	1.29	5.1	3.6	1.8	1.9	7.1	2.2	1.9	1.11	0.85	0.65	0.65
5	1.7	4.6	2.9	1.7	1.9	6.4	2.0	1.8	0.96	0.80	0.55	0.90
6	2.7	4.3	2.8	1.7	1.8	6.7	1.8	1.8	0.96	0.75	0.55	1.00
7	2.5	3.8	2.3	1.8	1.8	7.4	1.7	1.8	2.4	0.70	0.55	1.05
8	2.0	3.3	2.3	1.9	1.9	6.1	2.3	1.7	2.7	0.65	0.60	1.00
9	1.7	3.0	2.6	2.0	2.2	4.9	4.0	1.9	1.7	0.65	0.55	0.90
10	1.6	2.8	2.1	2.1	2.6	6.9	3.1	1.8	1.41	0.55	0.55	0.75
11	1.6	2.7	2.0	2.1	3.4	8.6	2.7	2.1	1.21	0.65	0.60	0.60
12	1.6	2.6	2.3	2.3	5.2	9.1	4.1	2.4	2.6	0.60	0.70	0.75
13	1.8	2.5	2.4	2.4	8.3	8.1	4.8	6.7	2.2	0.55	0.55	0.90
14	2.1	2.4	2.4	2.2	10.3	9.7	5.3	8.0	1.7	0.55	0.50	1.20
15	2.4	2.3	2.4	2.2	†10.6	10.3	5.5	8.1	1.41	0.45	0.45	1.35
16	2.6	2.3	2.5	2.1	10.6	9.3	3.9	4.8	1.21	0.45	0.45	1.40
17	2.5	2.4	2.5	2.1	9.7	8.2	3.0	2.8	1.31	0.50	0.45	2.2
18	2.4	2.3	2.4	2.1	9.1	5.1	3.4	2.3	1.5	0.55	0.45	2.2
19	4.6	2.2	2.4	2.1	8.3	4.1	3.8	2.0	1.16	0.45	0.55	2.0
20	4.9	2.2	2.5	2.1	8.1	3.5	3.0	1.8	0.96	0.45	‡0.35	1.9
21	6.4	2.2	3.3	2.0	‖8.8	3.2	2.5	1.7	0.91	0.40	‡0.40	2.6
22	7.7	2.6	5.6	2.0	9.5	3.0	2.9	1.7	1.16	0.40	0.45	4.2
23	6.3	3.6	6.4	2.0	8.4	2.6	3.3	1.8	1.6	0.45	0.45	5.1
24	8.7	4.4	5.2	1.9	5.8	2.6	4.2	1.7	1.6	0.50	0.45	3.6
25	10.4	3.2	6.2	1.9	5.6	2.4	3.8	1.6	1.31	1.40	0.45	2.4
26	10.0	2.6	6.9	1.9	7.7	2.3	3.0	1.46	1.11	1.05	0.45	2.7
27	9.0	2.4	5.9	2.1	8.2	2.1	2.7	1.7	0.96	0.95	0.45	3.2
28	8.1	2.4	4.0	2.1	8.9	2.1	2.6	1.9	0.86	0.80	0.45	4.2
29	7.7	2.4	2.9	2.1	------	2.0	2.5	1.6	0.86	0.80	0.50	4.2
30	8.9	3.2	2.4	2.0	------	2.0	2.6	1.41	0.80	1.00	0.55	2.8
31	10.1	------	2.2	2.0	------	1.9	------	1.26	------	1.40	0.70	------

NOTES—*Gage heights affected by ice December 2, 1917 to February 14, 1918. ‖Interpolated. †Maximum 11.1 feet from hydrograph at 10 p. m. ‡Minimum 0.35 foot.

Daily Discharge, in second-feet, of Cussewago Creek near Meadville, Crawford County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	5	13	425	129	84	164	144	31	425	132	11	18
2	5	16	313	102	164	122	288	39	468	126	10	14
3	5	15	144	120	114	108	398	43	234	248	8	11
4	5	13	84	120	84	90	398	31	132	126	7	10
5	4	12	126	199	72	67	199	84	84	47	7	9
6	4	10	206	280	62	52	164	322	78	28	7	10
7	3	9	144	313	52	39	304	332	234	20	6	10
8	‡2	9	78	264	47	80	364	296	342	52	6	8
9	3	11	213	206	43	178	398	227	353	108	6	12
10	4	15	157	150	35	192	272	171	519	144	6	11
11	5	16	157	126	28	234	164	150	501	386	6	8
12	6	16	90	96	22	†709	171	72	686	468	6	7
13	6	16	67	78	18	861	185	62	753	538	6	6
14	22	22	78	67	16	663	126	52	102	332	7	6
15	25	47	*72	57	14	501	90	39	96	199	7	6
16	25	52	62	52	12	620	78	28	67	171	7	6
17	16	39	52	47	14	468	72	25	47	114	8	5
18	15	35	47	43	20	364	57	22	39	114	6	5
19	18	31	43	39	20	353	126	25	35	144	6	4
20	35	43	41	35	35	206	171	62	31	96	6	5
21	78	67	43	31	72	220	192	206	28	90	5	5
22	62	67	47	35	102	227	102	150	22	102	5	5
23	35	43	43	43	108	241	67	185	18	72	14	5
24	25	126	39	39	126	256	47	220	36	39	13	6
25	18	227	35	35	144	375	39	220	43	25	18	5
26	16	138	35	31	150	313	39	375	31	144	16	5
27	13	114	62	25	164	138	62	453	84	43	12	5
28	12	157	120	20	171	120	47	364	332	25	8	5
29	11	342	199	20	-------	157	39	468	322	20	31	5
30	11	425	188	25	-------	213	31	578	220	15	67	5
31	9	-------	157	35	-------	178	-------	686	-------	11	43	-------

NOTES—*Creek frozen December 15, 1916 to March 12, 1917, inclusive, and discharge estimated from climatological data. †Maximum=1,290 second-feet. ‡Minimum=2 second-feet. Discharge above 1,130 second-feet is estimated.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	7	732	220	16	14	641	25	39	9	6	8	4
2	7	519	*234	16	14	663	22	31	8	6	5	2
3	10	296	144	15	14	620	28	28	9	6	4	2
4	12	206	72	14	13	375	35	25	8	6	4	4
5	20	171	43	13	12	304	28	22	7	5	2	6
6	57	150	31	12	11	332	22	22	7	4	2	7
7	47	120	25	12	11	411	20	22	43	4	2	8
8	28	90	20	13	12	280	39	20	57	4	3	7
9	20	72	18	14	14	192	132	25	20	4	2	6
10	18	62	16	16	20	353	78	22	14	2	2	4
11	18	57	16	17	35	620	57	31	10	4	3	3
12	18	52	16	18	147	732	138	43	52	3	4	4
13	22	47	16	18	342	519	185	332	35	2	2	6
14	31	43	14	17	756	890	220	501	20	2	2	10
15	43	39	14	16	†1,160	1,070	234	519	14	2	2	13
16	52	39	14	16	1,160	780	126	185	10	2	2	14
17	47	43	14	16	890	538	72	62	12	2	2	35
18	43	39	14	16	732	206	96	39	16	2	2	35
19	171	35	16	15	558	138	120	28	9	2	2	28
20	192	35	20	14	519	102	72	22	7	2	‡1	25
21	304	35	31	14	663	84	47	20	6	2	‡2	52
22	453	52	67	14	833	72	67	20	9	2	2	144
23	296	108	102	13	578	52	90	22	18	2	2	206
24	641	157	78	13	256	52	144	20	18	2	2	108
25	1,100	84	72	12	241	43	120	18	12	14	2	43
26	980	52	102	14	453	39	72	15	8	8	2	57
27	709	43	114	16	538	31	57	20	7	6	2	84
28	519	43	79	17	686	31	52	25	6	5	2	144
29	453	43	43	17	-------	28	47	18	6	5	2	144
30	686	84	28	16	-------	28	52	14	6	7	2	62
31	1,010	-------	20	14	-------	25	-------	11	-------	14	4	-------

NOTES—*Gage heights affected by ice December 2, 1917, to February 14, 1918, and discharge estimated from one discharge measurement and climatological data. †Maximum 1,310 second-feet from hydrograph at 10 p. m. ‡Minimum 1 second-foot.

Estimated Monthly Discharge of Cussewago Creek near Meadville, Crawford County
(Drainage area, 88 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	78	‡2	16	0.18	0.21
November	425	9	72	0.82	0.92
December	----------	----------	115	1.31	1.51
January	----------	----------	92	1.05	1.21
February	----------	----------	71	0.81	0.84
March	†	----------	275	3.12	3.60
April	398	31	161	1.83	2.04
May	686	22	194	2.20	2.54
June	686	18	199	2.26	2.52
July	538	11	135	1.53	1.76
August	67	5	12	0.14	0.16
September	18	4	7	0.08	0.09
The year	686	2	113	1.28	17.14

NOTES—Creek frozen December 15, 1916 to March 12, 1917, inclusive, and discharge estimated from climatological data. †Maximum=1,290 second-feet, March 12, 1917. ‡Minimum=2 second-feet October 8, 1916. Discharge above 1,130 second-feet is estimated.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	1,100	7	259	2.94	3.39
November	732	35	118	1.34	1.50
December	----------	----------	55	0.62	0.72
January	----------	----------	15	0.17	0.20
February	1,160	----------	382	4.34	4.52
March	1,070	25	331	3.76	4.34
April	234	20	83	0.94	1.05
May	519	11	72	0.82	0.95
June	57	6	15	0.17	0.19
July	14	2	4	0.05	0.06
August	8	1	3	0.03	0.03
September	206	2	42	0.48	0.54
The year	1,170	1	113	1.28	17.49

NOTES—Gage heights affected by ice December 2, 1917, to February 14, 1918, and discharge estimated from one discharge measurement and climatological data. Maximum 1,310 second-feet February 15. Minimum 1 second-foot August 20 and 21.

OHIO BASIN—STATION NO. 8

FRENCH CREEK AT CARLTON

DESCRIPTION OF STATION

Location—At two span, steel, through truss, highway bridge at Carlton, Mercer County.

Records Available—Discharge measurements and gage heights from April 29, 1908, to September 30, 1918. Discharge formerly published at this station is in error due to a revision of drainage area and additional discharge measurements which indicate a change in the discharge curve formerly used. For other records on this creek see French Creek at Kimmeytown and North Branch French Creek at Kimmeytown in the 1911 to 1914 reports of the Water Supply Commission.

Drainage Area—1,000 square miles (formerly published as 1,070 square miles)

Gage—A staff gage, whose elevation of zero is 1,033.60 feet above mean sea level, is fastened to the downstream face of the pier in the right span. On August 7, 1914, a standard chain gage, placed on the same datum as the staff gage, was fastened on the downstream side of the bridge and is read twice daily by J. A. Hilliard.

Channel—The right bank is high and not subject to overflow: the left is low and overflows during high stages, and the bed is composed of sand, gravel and boulders.

Discharge Measurements of French Creek at Carlton, Mercer County
(Drainage area, 1,000 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
44	Mar. 12	Wilson & McLaughlin	2,006	8.95	10,199	Surface method
45	Mar. 13	Wilson & McLaughlin	2,163	9.57	11,499	Surface method
46	Mar. 16	Wilson & McLaughlin	1,461	6.88	6,794	Surface method
47	Mar. 17	Wilson & McLaughlin	1,176	5.80	5,165	Surface method
48	Mar. 23	Wilson & McLaughlin	789	4.22	2,999	Multiple point method
54	Sept. 29	Wilson	70	0.42	124	0.2, 0.6 & 0.8 method
53	July 27	Wilson	325	1.87	882	0.2, 0.6 & 0.8 method
49	Apr. 23	Wilson	439	2.55	1,420	Surface method
50	May 5	Wilson	561	3.18	1,809	0.2 & 0.8 method
51	May 10	Wilson	880	4.60	3,468	0.6 method
52	May 21	Wilson	686	3.74	2,323	0.6 method

Daily Mean Gage Heights, in feet, of French Creek at Carlton, Mercer County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.42	0.74	5.5	4.5	4.9	6.0	4.0	1.8	5.7	4.3	1.1	1.3
2	0.42	0.95	4.4	3.9	5.0	5.4	4.8	1.8	5.4	3.6	1.0	1.1
3	0.42	1.1	3.3	3.9	4.3	4.1	5.4	1.8	4.6	4.3	0.97	1.0
4	0.42	1.1	2.9	4.1	*3.5	3.4	4.8	2.1	3.8	3.6	0.87	0.99
5	0.41	1.0	3.6	4.0	3.2	2.8	4.7	3.0	3.2	2.8	0.76	0.98
6	0.40	0.93	3.7	7.0	2.5	2.5	4.2	4.5	3.3	2.2	0.66	1.0
7	0.39	0.90	3.3	8.4	2.5	2.5	5.1	5.1	5.4	1.9	0.61	1.1
8	‡0.38	0.86	2.6	8.0	2.2	3.2	5.4	5.1	5.6	1.9	0.59	1.0
9	0.39	0.85	2.6	6.3	2.5	4.3	4.9	4.7	6.3	2.5	0.57	0.91
10	‡0.38	0.93	3.2	5.2	2.5	4.3	4.3	4.6	6.6	4.4	0.57	0.76
11	0.38	1.2	3.2	*4.1	3.7	5.9	3.8	4.2	6.0	5.8	0.57	0.73
12	0.38	1.2	2.8	3.5	4.7	8.9	3.6	3.3	5.3	6.0	0.57	0.69
13	0.42	1.1	2.4	3.1	4.4	†9.5	3.4	2.8	4.1	6.5	0.69	0.61
14	0.90	1.3	*1.8	2.7	4.4	9.0	3.1	2.4	3.3	4.9	1.2	0.62
15	1.3	1.6	2.0	2.4	4.4	8.0	3.0	2.2	3.0	5.9	0.97	0.65
16	1.2	1.8	2.0	2.3	4.1	7.0	2.7	1.9	2.7	4.9	0.85	0.59
17	1.2	1.7	2.2	2.3	3.8	5.8	2.6	1.8	2.3	3.4	0.72	0.57
18	1.1	1.6	2.0	2.2	3.7	6.0	2.3	1.7	2.2	3.4	0.67	0.57
19	1.0	1.5	2.0	2.2	3.8	5.3	2.4	1.7	2.0	3.3	0.61	0.57
20	1.6	1.6	2.0	2.4	4.4	4.6	3.6	2.6	1.9	3.2	0.59	0.58
21	2.2	1.9	2.0	2.2	5.0	4.4	3.5	3.7	1.8	2.8	0.57	0.55
22	2.0	2.0	2.0	2.1	5.0	4.1	3.0	3.9	1.7	2.9	0.55	0.53
23	1.6	2.0	2.0	2.1	4.9	4.2	2.5	4.2	1.5	2.5	0.95	0.49
24	1.3	3.0	2.1	3.3	5.6	5.4	2.2	4.5	2.8	2.3	1.2	0.47
25	1.2	3.9	2.2	3.2	5.6	6.0	2.1	5.3	3.0	1.9	1.2	0.47
26	1.1	3.7	2.0	2.8	4.9	5.0	2.1	5.8	2.6	2.1	1.1	0.47
27	1.0	3.1	3.0	2.6	5.4	4.1	2.2	5.2	4.8	1.7	0.97	0.47
28	0.90	3.5	5.0	2.3	5.9	3.9	2.1	5.1	6.5	1.4	0.73	0.57
29	0.79	4.9	5.8	2.3	-------	4.1	2.0	7.4	6.2	1.3	0.77	0.42
30	0.72	6.0	5.6	3.0	-------	4.4	1.8	7.6	4.9	1.3	1.5	0.45
31	0.64	-------	5.0	4.4	-------	4.2	-------	7.1	-------	1.2	1.6	-------

NOTES—*Creek frozen December 14 to 28, 1916; January 11 to 11 a. m., January 31st, and February 4 to 23, 1917, inclusive. †Maximum 9.6 feet at 5 p. m. ‡Minimum 0.38 feet October 8, and 10 to a. m. of 13, 1916.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.57	9.5	2.9	2.9	2.4	7.1	1.6	1.9	1.4	0.81	1.9	0.43
2	0.57	7.5	3.7	2.8	2.4	6.6	1.6	1.8	1.2	1.1	1.6	0.43
3	0.69	5.4	3.2	2.7	2.4	5.9	1.6	1.6	1.1	1.8	1.0	0.46
4	1.3	4.4	2.6	2.5	2.4	5.5	1.8	1.5	1.1	1.5	0.86	0.46
5	1.4	3.9	2.3	2.5	2.4	5.2	1.8	1.5	1.2	1.1	0.66	†0.56
6	1.8	3.5	2.1	2.4	2.4	6.0	1.6	1.5	1.1	0.89	0.58	0.88
7	1.6	3.1	1.8	2.6	2.4	6.0	1.5	1.4	1.4	0.70	0.63	0.83
8	1.4	2.9	1.7	2.6	2.4	5.6	1.8	1.4	1.5	0.60	0.68	0.80
9	1.4	2.7	*2.2	2.6	2.4	4.8	2.5	1.4	1.3	0.57	0.63	0.73
10	1.2	2.5	3.2	2.5	2.8	6.9	2.8	1.8	1.2	0.56	0.70	0.68
11	1.1	2.3	3.4	2.5	2.9	6.9	2.6	1.9	1.1	0.59	0.70	0.60
12	0.99	2.2	3.4	2.5	2.8	6.7	3.0	2.3	2.2	0.58	0.66	0.56
13	1.2	2.1	3.6	2.5	2.9	6.2	2.4	4.7	2.0	0.73	0.60	0.58
14	1.5	2.0	3.5	2.7	9.5	9.1	3.8	5.8	2.3	0.74	0.60	0.58
15	1.7	1.9	3.5	2.6	8.1	10.5	4.1	5.1	1.9	0.62	0.56	0.58
16	1.8	1.8	3.5	2.6	8.3	†10.9	3.6	3.8	1.6	0.58	0.50	0.70
17	1.7	1.8	3.4	2.6	8.2	8.4	2.7	2.9	1.4	0.58	0.43	1.1
18	1.4	1.8	3.4	2.6	7.7	5.8	3.0	2.4	1.2	0.57	0.40	1.9
19	1.9	1.7	3.2	2.6	6.6	5.0	3.2	2.0	1.0	0.49	0.38	1.7
20	5.1	1.6	3.2	2.6	8.3	4.3	2.8	1.8	0.86	0.44	0.38	1.6
21	5.1	1.6	3.3	2.6	8.6	3.6	2.5	1.6	0.76	0.40	0.38	1.6
22	3.8	1.7	4.2	2.7	8.9	3.2	2.4	1.6	2.3	0.38	‡0.36	2.8
23	2.5	2.2	4.4	2.6	7.4	3.0	2.6	2.2	2.2	0.38	‡0.36	3.1
24	4.4	2.4	4.6	2.6	5.5	2.7	3.2	2.0	2.0	0.56	‡0.36	2.5
25	7.7	2.3	5.2	2.5	5.0	2.5	3.2	1.8	1.8	0.87	‡0.36	2.0
26	8.3	2.0	5.5	2.5	5.8	2.3	2.7	1.6	1.5	0.73	‡0.36	1.8
27	8.0	1.7	5.1	2.5	6.1	2.1	2.4	1.5	1.3	0.65	‡0.36	1.8
28	6.8	1.7	3.8	2.5	6.5	2.0	2.3	2.0	1.1	0.78	‡0.37	2.4
29	6.2	1.7	3.2	2.4	-------	1.8	2.2	1.8	0.96	0.93	0.46	2.1
30	8.5	2.0	3.2	2.4	-------	1.8	2.1	1.6	0.86	2.0	0.46	1.6
31	9.4	-------	3.0	2.4	-------	1.7	-------	1.5	-------	2.3	0.43	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 14, 1918. †Maximum 11.2 feet from hydrograph at 2 a. m. ‡Minimum 0.36 foot.

OHIO BASIN—STATION NO. 9

ALLEGHENY RIVER AT FRANKLIN

DESCRIPTION OF STATION

Location—At four span, steel, through truss, highway bridge at Eighth Street, Franklin, Venango County.

Records Available—Discharge measurements and gage heights from June 1, 1915, to September 30, 1918. Gage heights have been observed by the U. S. Weather Bureau since April 1, 1905. For other records on this river see Allegheny River at Larabee, Kittanning and Freeport; also Allegheny River at Red House, N. Y. in the 1911 to 1914 reports of the Water Supply Commission.

Drainage Area—6,010 square miles.

Gage—A staff gage, whose elevation of zero is 958.26 feet above mean sea level, is painted on the east side of the first pier from the east bank and is read twice daily by William C. Rivers.

Channel—Both banks are high and not subject to overflow and the bed is composed of gravel and boulders.

Remarks—This station is maintained in co-operation with the U. S. Engineer Office in Pittsburgh.

Discharge Measurement of Allegheny River at Franklin, Venango County
(Drainage area, 6,010 square miles)

No	Date	Hydrographer	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
10	July 21	Wilson	4,026	3.40	10,817	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Allegheny River at Franklin, Venango County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	–0.4	0.6	5.9	3.7	12.1	6.9	5.7	2.0	7.4	4.0	1.9	1.2
2	–0.4	0.5	4.9	3.2	14.9	6.0	6.0	2.0	7.3	5.5	1.8	1.0
3	–0.4	0.5	3.9	3.1	13.6	5.0	6.6	2.2	6.2	6.2	1.6	1.0
4	–0.4	0.5	3.1	3.4	11.9	4.4	6.2	2.2	5.3	5.7	1.4	1.5
5	–0.4	0.5	2.9	5.0	11.5	3.6	5.5	2.9	4.5	4.4	1.2	1.7
6	–0.4	0.5	3.1	9.8	11.0	3.0	5.4	4.7	4.2	3.4	1.0	1.7
7	‡–0.5	0.4	3.0	7.8	11.0	2.6	6.2	5.4	6.3	3.0	0.9	1.4
8	–0.5	0.4	2.6	7.0	11.0	3.4	6.1	5.6	8.0	2.9	0.8	1.6
9	–0.5	0.4	2.7	5.9	10.5	3.8	5.8	5.0	8.4	3.3	0.8	1.2
10	–0.5	0.7	2.6	5.0	9.6	3.6	5.0	5.0	7.8	5.2	0.7	1.1
11	–0.5	1.0	2.6	4.4	8.0	5.0	4.5	4.7	8.6	6.6	0.6	1.0
12	–0.5	1.3	2.6	3.4	8.0	†10.1	4.0	4.2	7.3	6.9	0.6	0.9
13	–0.4	1.2	2.4	2.9	8.0	10.2	3.9	3.6	6.0	6.4	0.5	0.8
14	–0.0	1.1	2.2	2.8	8.4	9.0	3.8	3.2	5.0	5.5	0.7	0.7
15	0.4	1.3	*2.0	2.6	8.2	8.9	3.5	2.9	4.4	6.3	1.7	0.6
16	0.8	1.4	1.9	2.5	8.2	7.6	3.2	2.7	3.7	5.4	2.2	0.5
17	0.6	1.3	1.8	2.4	8.0	6.8	2.9	2.4	3.4	4.4	2.3	0.5
18	0.4	1.2	1.7	2.2	8.0	7.5	2.6	2.2	3.0	3.7	2.3	0.4
19	0.7	0.9	1.6	2.2	8.0	6.9	2.6	2.3	2.8	3.5	2.0	0.4
20	1.8	0.8	1.5	2.2	7.9	6.0	3.2	2.8	2.5	3.4	1.9	0.4
21	2.0	0.8	1.6	2.2	8.6	5.4	3.2	4.2	2.2	3.4	1.6	0.3
22	2.2	1.0	1.7	*9.6	9.0	5.2	3.0	4.7	2.0	3.3	1.2	0.3
23	1.8	1.2	1.7	10.6	9.0	5.2	2.9	5.4	1.9	3.2	1.6	0.2
24	1.6	2.4	1.7	12.0	9.7	7.7	2.7	5.6	2.6	2.8	1.9	0.1
25	1.2	4.0	1.9	11.9	10.3	8.6	2.5	5.7	3.2	2.5	1.9	0.0
26	1.0	3.7	1.9	11.4	10.4	7.6	2.4	6.0	3.3	2.4	1.6	0.0
27	0.9	3.0	2.4	10.2	20.1	6.9	2.4	5.4	6.0	2.7	1.2	–0.1
28	0.8	2.9	5.1	9.6	12.9	6.8	2.3	5.4	6.0	2.8	0.8	–0.1
29	0.6	4.2	5.1	9.5	-------	6.7	2.2	7.6	5.4	2.4	0.7	–0.1
30	0.5	6.7	4.7	9.8	-------	6.5	2.1	7.9	4.7	2.2	0.7	–0.1
31	0.5	-------	4.1	10.7	-------	6.0	-------	6.9	-------	2.0	1.2	-------

NOTES—*River frozen December 15 to 27, 1916 and January 22 to February 27, 1917, inclusive. †Maximum 11.0 feet at 11 p. m. estimated from hydrograph. ‡Minimum—0.5 feet October 7 to 12, 1916, inclusive.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.2	10.7	1.8	2.4	-------	9.5	2.4	2.6	2.4	1.9	1.7	0.4
2	0.3	8.8	2.7	2.1	-------	8.8	2.4	2.4	2.2	1.8	1.3	0.5
3	0.4	6.9	2.8	2.0	-------	8.2	2.3	2.2	2.0	1.8	0.8	0.6
4	0.6	5.9	2.5	1.9	-------	7.3	2.4	2.0	2.0	1.6	0.6	0.6
5	0.9	5.0	2.2	1.8	-------	7.0	2.6	1.8	1.8	1.4	0.3	0.6
6	1.2	4.4	2.1	1.7	-------	7.0	2.6	1.7	1.7	1.2	0.6	0.1
7	1.4	3.8	2.1	1.7	-------	7.8	2.4	1.6	2.0	1.0	1.1	1.7
8	1.2	3.4	2.0	1.7	-------	7.1	2.8	1.5	2.0	0.9	0.8	1.8
9	1.0	3.0	1.9	1.7	-------	6.0	3.2	1.4	1.8	0.8	0.8	1.4
10	0.9	2.8	*	1.6	-------	8.3	3.2	1.7	1.6	0.7	1.0	1.0
11	0.8	2.6	-------	1.6	-------	8.6	3.0	3.0	1.4	0.6	1.2	0.8
12	0.7	2.4	-------	1.6	-------	7.6	3.2	3.2	1.8	0.5	1.0	0.6
13	0.8	2.3	-------	*	5.6	6.8	3.4	5.0	2.7	0.4	0.8	0.6
14	1.2	2.2	-------	-------	7.5	11.6	4.0	6.3	2.4	0.4	1.0	1.4
15	1.4	2.2	-------	-------	11.3	†15.6	4.6	5.2	2.2	0.3	0.8	1.8
16	1.8	2.0	-------	-------	8.4	13.2	4.5	4.2	2.0	0.3	0.6	1.8
17	2.2	1.9	-------	-------	7.4	10.8	4.2	3.4	1.7	0.2	0.0	2.2
18	2.2	1.8	-------	-------	6.3	8.4	4.4	3.0	1.7	0.2	0.4	2.7
19	2.4	1.7	-------	-------	6.0	6.8	4.7	2.8	1.6	0.2	0.3	2.8
20	4.6	1.6	2.2	-------	14.1	5.9	4.5	2.4	1.4	0.1	0.2	2.6
21	5.5	1.5	2.3	-------	11.8	5.2	4.0	2.8	1.2	0.0	0.1	2.7
22	4.6	1.5	2.7	-------	9.3	4.7	3.8	3.1	3.8	0.0	0.0	3.3
23	4.0	1.6	2.8	-------	7.8	4.4	3.8	3.6	4.0	–0.1	–0.1	3.3
24	4.7	1.8	3.2	-------	6.9	4.0	4.0	3.2	3.6	0.3	–0.1	2.7
25	8.0	2.2	3.3	-------	6.0	3.8	3.8	3.2	3.0	0.2	–0.2	2.3
26	8.6	2.0	3.4	-------	7.6	3.4	3.5	3.0	2.6	0.4	–0.2	2.0
27	8.6	1.8	3.7	-------	7.7	3.0	3.2	3.5	2.2	0.8	‡–0.3	2.2
28	9.7	1.6	3.4	-------	7.6	3.0	3.0	4.2	2.0	0.6	‡–0.3	2.3
29	9.5	1.4	3.1	-------	-------	2.8	3.0	3.4	1.8	0.4	–0.1	2.2
30	13.0	1.4	2.8	-------	-------	2.6	2.8	2.8	1.8	0.9	–0.1	2.0
31	12.6	-------	2.6	-------	-------	2.5	-------	2.5	-------	1.9	0.2	-------

NOTES—*Gage heights affected by ice December 10 to 24, 1917; January 13 to February 13, 1918. †Maximum 16.1 feet from hydrograph at 4 a. m. ‡Minimum—0.3 foot.

OHIO BASIN—STATION NO. 10

SANDY CREEK AT SANDY LAKE

DESCRIPTION OF STATION

Location—At single span, iron, through truss, highway bridge at Lake Street, Sandy Lake, Mercer County.

Records Available—Discharge complete from May 11, 1914, to September 30, 1915, and discharge measurements and gage heights from October 1, 1915, to July 28, 1918.

Drainage Area—54 square miles.

Gage—A standard chain gage, whose elevation of zero is 1,150.88 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by T. S. Bailey.

Channel—Both banks are low, with small willows bordering the creek channel, and the bed is composed of gravel and stones, with occasional sand bars. There are two islands above the bridge, and one below, the latter becoming submerged at approximately gage height 2.5 feet.

Discharge Measurements of Sandy Creek at Sandy Lake, Mercer County
(Drainage area, 54 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq.ft.	Feet	Sec.-ft.	
13	Mar. 22	Wilson & McLaughlin	97	1.74	174	Multiple point method
14	Apr. 28	Wilson	50	1.05	53	Surf. & 0.6 method
15	May 17	Wilson	34	0.78	29	Surface method
16	July 20	Wilson	79	1.60	101	0.6 method

Daily Mean Gage Heights, in feet, of Sandy Creek at Sandy Lake, Mercer County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.51	0.61	1.7	1.9	2.4	1.8	1.07	0.86	1.6	1.8	0.8	0.60
2	0.50	0.78	1.6	1.29	2.4	1.41	1.25	0.91	1.7	1.6	0.85	0.53
3	0.50	0.82	1.18	1.18	2.6	1.15	1.29	0.88	1.7	1.34	0.84	0.60
4	0.50	0.82	1.14	1.4	2.3	1.13	1.42	0.90	1.41	1.16	0.78	0.56
5	0.48	0.59	1.12	2.5	2.0	1.05	1.25	1.34	1.23	0.91	0.49	0.54
6	0.48	0.61	1.18	†4.4	1.8	1.13	1.37	1.8	1.30	0.82	0.60	0.74
7	0.45	0.62	1.14	3.4	1.8	1.21	1.9	1.9	1.6	0.76	0.70	0.81
8	0.42	0.56	1.13	2.4	1.29	1.17	2.1	1.7	1.8	0.82	0.60	1.10
9	0.65	0.47	1.11	1.7	1.34	1.6	1.9	1.6	3.6	0.84	0.85	1.01
10	0.58	0.52	1.11	1.4	1.34	1.7	1.39	1.20	3.3	1.8	0.60	0.86
11	0.60	0.61	1.21	1.4	1.44	2.3	1.14	1.10	2.8	2.3	0.52	0.92
12	0.66	0.74	1.09	1 5	1.9	3.8	1.02	0.96	2.6	2.7	0.45	0.84
13	0.70	0.84	1.04	1.27	1.8	2.9	1.01	0.86	1.9	2.2	0.65	0.54
14	0.74	0.98	1.29	1.07	1.6	2.2	0.96	0.79	1.46	1.9	0.86	0.79
15	0.61	1.22	1.00	0.92	1.5	2.0	0.92	0.81	1.22	2.0	0.82	0.44
16	0.59	1.11	*1.17	*1.30	1.5	1.7	0.87	0.80	1.12	2.0	0.80	0.48
17	0.73	1.11	1.08	1.27	1.5	1.5	0.89	0.76	1.01	1.8	0.80	0.66
18	0.72	1.01	1.17	1.45	1.44	1 6	0.90	0.79	0.92	1.6	0.81	0.61
19	1.24	0.73	1.26	1.5	1.5	1.5	1.00	0.78	0.92	1.5	0.39	0.66
20	1.33	0.82	1.21	1.33	2.0	1.4	1.17	1.04	0.94	1.5	0.62	0.60
21	1.21	0.79	1.10	1.32	2.0	1.5	1.18	1.32	0.91	1.24	0.89	0.57
22	1.04	0.78	0.98	1.36	2.0	1.7	1.07	1.6	0.86	1.21	0.72	0.50
23	0.99	0.86	1.18	1.5	2.1	1.6	0.91	1.5	0.80	1.22	1.35	‡0.34
24	0.74	1.27	1.18	2.0	2.1	2.0	0.93	1.5	0.97	1.20	1.5	0.55
25	0.72	1.42	0.91	1.7	2.0	2.1	0.97	1.42	1.41	1.09	1.13	0.65
26	0.74	1.43	0.97	1.7	2.2	1.8	1.06	1.40	1.7	0.99	0.83	0.40
27	0.72	1.48	1.17	1.7	1.9	1.4	1.03	1.24	1.6	0.95	0.67	0.40
28	0.47	1.7	2.1	1.44	1.9	1.2	1.01	1.42	1.7	0.90	0.71	0.46
29	0.51	1.5	2.7	1.31	-------	1.2	0.82	1.7	2.2	0.87	0.72	1.15
30	0.65	1.7	3.1	1.6	-------	1.2	0.81	2.4	2.0	0.71	0.72	0.37
31	0.70	-------	2.4	1.8	-------	1.1	-------	2.0	-------	0.77	0.70	-------

NOTES—*Creek frozen December 16, 1916 to January 5, 1917, and January 16 to March 12, 1917, inclusive. †Maximum 4.4 feet at 4 p. m. ‡Minimum 0.31 feet at 8:00 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.80	2.8	1.18	1.5	2.2	2.5	0.80	1.07	0.95	0.64	-------	-------
2	0.62	2.0	1.29	1.38	2.2	3.2	0.80	0.99	0.78	0.58	-------	-------
3	0.72	1.6	1.35	1.38	2.1	2.5	0.84	0.85	0.84	0.51	-------	-------
4	0.54	1.35	1.10	1.38	2.1	1.9	0.87	0.84	0.87	0.41	-------	-------
5	1.06	1.27	1.02	1.38	2.2	1.8	0.86	0.81	1.29	0.70	-------	-------
6	0.97	1.24	0.98	1.38	2.2	1.8	0.82	0.83	1.44	0.70	-------	-------
7	0.88	1.20	0.90	2.0	2.3	1.9	0.90	0.85	1.6	‡0.32	-------	-------
8	1.08	1.19	*0.99	2.0	2.3	1.7	1.13	0.90	1.5	0.69	-------	-------
9	0.75	1.02	1.28	2.0	2.3	1.7	1.29	0.81	1.41	0.68	-------	-------
10	0.73	0.94	1.33	1.6	2.3	2.2	1.26	0.85	1.13	0.71	-------	-------
11	0.70	0.94	1.26	1.5	2.2	2.6	1.24	1.03	1.00	0.62	-------	-------
12	0.71	0.99	1.24	1.34	2.5	2.4	1.26	1.09	0.97	0.64	-------	-------
13	0.84	0.95	1.26	1.6	3.9	2.0	1.49	2.0	0.97	0.65	-------	-------
14	0.92	0.86	1.26	1.9	4.4	3.2	1.6	2.5	0.97	0.64	-------	-------
15	0.97	0.97	1.26	2.0	4.9	4.5	1.44	2.3	0.85	0.64	-------	-------
16	1.00	1.09	1.26	1.9	4.5	2.9	1.26	1.7	0.97	0.64	-------	-------
17	0.97	1.04	1.7	1.9	3.8	1.9	1.21	1.25	0.96	0.61	-------	-------
18	0.81	0.87	1.6	1.8	3.2	1.6	1.37	1.00	0.95	0.62	-------	-------
19	1.33	0.94	1.33	1.8	3.0	1.37	1.24	0.88	0.94	0.63	-------	-------
20	2.2	0.97	1.25	1.7	†5.1	1.21	1.10	0.92	0.91	0.61	-------	-------
21	2.4	0.99	1.10	1.8	4.6	1.10	0.99	0.96	0.89	0.60	-------	-------
22	2.0	0.99	1.13	1.9	4.1	1.04	1.10	0.95	0.91	0.60	-------	-------
23	1.5	1.02	1.6	1.9	3.2	1.00	1.12	1.11	1.25	0.60	-------	-------
24	1.8	1.12	1.41	2.0	2.1	0.93	1.24	1.05	1.31	0.62	-------	-------
25	3.6	0.98	1.5	2.2	1.8	0.89	1.24	0.99	1.21	0.62	-------	-------
26	4.2	1.00	*1.8	2.2	1.8	0.96	1.18	1.03	1.17	0.72	-------	-------
27	3.1	0.85	1.8	2.1	1.7	0.89	1.04	0.99	0.80	0.64	-------	-------
28	2.3	0.74	1.6	2.1	1.9	0.85	1.01	1.25	0.80	0.64	-------	-------
29	2.0	0.74	1.24	2.1	-------	0.83	1.07	1.15	0.78	**	-------	-------
30	2.9	0.75	1.43	2.1	-------	0.81	1.16	0.85	0.72	-------	-------	-------
31	3.6	-------	1.42	2.2	-------	0.81	-------	1.19	-------	-------	-------	-------

NOTES—*Gage heights affected by ice December 8 to17, 1917; December 26, 1917 to February 15, 1918. †Maximum 5.4 feet from hydrograph at 8 p. m. ‡Minimum 0.32 foot. **Gage stolen.

OHIO BASIN—STATION NO. 11

CLARION RIVER NEAR CLARION

DESCRIPTION OF STATION

Location—At single span, steel, through truss, highway bridge about one mile above Clarion, Clarion County.

Records Available—Discharge complete from November 22, 1909, to September 30, 1915, and discharge measurements and gage heights from October 1, 1915, to September 30, 1918.

Drainage Area—910 square miles.

Gage—A Mott gage, whose elevation of zero is 1,052.0 feet above mean sea level, is located on the downstream side of the bridge and is read once daily by an employe of the U. S. Weather Bureau.

Channel—Both banks are high and not subject to overflow, and the bed is composed of rock, gravel and boulders.

Remarks—The U. S. Weather Bureau has observed gage heights at this station since November 17, 1884.

Discharge Measurements of Clarion River near Clarion, Clarion County
(Drainage area, 910 square miles)

No.	Date	Hydrographer	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
75	April 30	Wilson	659	1.32	670	Multiple point method
76	May 18	Wilson	727	1.78	900	0.2 & 0.8 method
77	July 25	Wilson	761	1.96	1,150	0.2 & 0.8 method
78	Oct. 1	Wilson	478	0.12	182	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Clarion River near Clarion, Clarion County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.2	0.3	2.6	2.7	3.0	4.2	3.8	1.3	4.6	3.8	1.7	0.9
2	0.0	0.2	2.4	2.5	2.8	3.6	3.7	1.2	5.4	3.1	1.5	0.7
3	-0.2	0.2	2.0	2.3	2.7	3.4	3.7	1.2	5.1	2.8	1.3	0.7
4	-0.2	0.3	1.8	2.1	2.5	3.5	3.5	1.1	3.9	2.5	1.0	0.6
5	-0.2	0.3	1.9	2.6	*2.5	3.2	3.4	1.3	3.5	2.3	0.9	0.5
6	-0.2	0.2	1.8	7.2	2.8	3.0	3.6	2.5	3.8	2.0	0.8	0.7
7	-0.2	0.2	1.5	5.1	2.8	2.8	3.8	2.7	5.0	1.8	0.7	0.9
8	-0.2	0.1	1.4	4.0	2.8	2.5	3.8	3.2	†7.7	1.8	0.5	1.0
9	-0.2	0.1	1.5	3.3	2.8	2.3	3.7	3.0	6.3	2.1	0.6	1.2
10	‡-0.2	0.3	1.3	3.1	2.8	2.3	3.6	3.0	5.8	3.4	1.4	0.9
11	-0.2	0.5	1.3	3.0	3.0	2.6	3.2	2.9	6.5	3.2	1.0	0.8
12	-0.2	0.4	1.2	2.8	3.0	7.3	2.9	2.9	6.2	3.2	0.7	0.6
13	-0.2	0.2	1.2	2.5	3.0	5.9	2.8	2.9	4.5	3.0	0.5	0.5
14	0.0	0.6	1.3	2.4	3.0	5.4	2.6	2.8	4.3	2.7	1.2	0.4
15	0.2	0.5	1.2	2.3	3.0	5.1	2.5	2.5	3.3	3.1	4.4	0.3
16	0.2	0.8	1.1	2.2	3.0	4.8	2.3	2.2	3.1	3.6	5.1	0.3
17	0.2	0.8	*1.7	2.0	3.0	4.6	2.1	1.9	2.9	3.8	3.8	0.2
18	0.2	0.8	1.7	2.0	3.0	4.2	1.9	1.8	2.4	3.5	2.5	0.1
19	0.2	0.6	2.0	4.6	3.0	3.9	2.0	1.8	2.1	3.4	2.1	0.1
20	0.8	0.6	2.0	5.6	3.5	4.2	1.8	2.1	1.9	3.2	1.6	0.0
21	2.0	0.6	2.0	5.0	3.5	3.8	1.8	2.1	1.7	2.7	1.4	0.0
22	2.4	0.4	2.0	6.0	3.5	4.0	1.7	2.5	1.6	2.5	1.4	0.0
23	1.8	0.4	2.0	6.0	3.3	3.7	1.7	4.5	1.4	2.3	1.6	-0.1
24	1.4	1.2	2.0	4.2	4.2	5.0	1.6	4.7	1.8	2.2	1.2	-0.1
25	0.8	1.2	2.0	3.8	4.0	4.8	1.5	3.8	2.4	2.0	1.4	-0.1
26	0.4	1.0	2.0	3.2	5.0	5.1	1.5	3.4	2.1	1.8	1.3	-0.2
27	0.4	1.2	2.0	2.8	5.6	5.0	1.6	3.2	3.0	1.7	1.0	-0.2
28	0.4	1.2	2.0	3.3	5.0	4.9	1.6	3.1	2.8	4.0	0.8	0.0
29	0.2	1.8	3.3	3.0	-------	4.6	1.5	4.6	4.1	3.8	0.7	0.0
30	0.2	2.0	3.0	2.5	-------	4.4	1.3	5.3	4.0	2.6	0.9	0.0
31	0.2	-------	2.8	2.8	-------	4.0	-------	4.4	-------	2.0	0.8	-------

NOTES—*River frozen December 17 to 28, 1916 and February 5 to 26, 1817 inclusive †Maximum 8.0 feet at noon estimated from hydrograph. ‡Minimum -0.25 feet October 10 to 13, 1916, inclusive.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.1	5.5	1.2	2.3	2.3	6.5	1.5	2.3	3.6	2.8	0.4	4.0
2	0.3	5.0	1.0	2.3	2.3	5.7	1.4	2.1	3.5	2.0	0.4	3.8
3	0.2	4.8	0.9	2.3	2.3	4.9	1.5	2.0	3.2	1.8	0.3	3.7
4	0.4	3.5	0.9	2.3	2.3	4.7	1.7	1.9	2.8	1.5	0.3	3.5
5	0.7	3.2	0.8	2.3	2.3	4.3	1.7	2.0	2.3	1.3	0.2	3.8
6	0.8	2.8	0.8	2.3	2.3	4.0	1.5	1.8	2.5	1.1	0.2	4.7
7	0.6	2.5	1.0	2.3	2.3	4.2	1.4	1.6	2.7	1.0	0.1	4.2
8	0.6	2.3	1.0	2.3	2.3	3.8	1.7	1.6	2.4	0.9	0.5	3.5
9	0.5	2.0	1.4	2.3	2.3	3.7	1.9	1.5	2.0	0.7	2.0	2.8
10	0.5	1.9	1.8	2.3	2.3	4.1	1.8	1.4	1.7	0.6	4.0	2.3
11	0.4	1.7	*1.8	2.3	2.3	4.6	1.8	1.4	1.4	0.6	5.6	1.8
12	0.6	1.6	1.8	2.3	2.3	4.5	2.0	1.3	1.2	0.5	6.0	1.3
13	0.8	1.5	1.8	2.3	5.6	4.1	2.1	2.0	1.1	0.5	5.5	2.0
14	0.7	1.3	1.8	2.3	9.5	6.0	2.1	2.6	1.1	0.4	5.0	2.5
15	0.7	1.2	1.8	2.3	5.2	12.2	2.0	2.8	1.0	0.4	5.0	2.0
16	1.0	1.2	1.8	2.3	4.8	7.3	1.8	2.5	1.0	0.3	4.6	1.8
17	1.5	1.1	1.8	2.3	4.5	5.2	1.7	2.4	1.2	0.3	4.0	2.0
18	1.2	1.0	1.8	2.3	4.0	4.7	2.3	2.0	1.1	**0.3	3.4	2.8
19	1.5	1.0	1.8	2.3	3.7	4.0	2.9	1.8	1.0	0.2	3.3	2.4
20	1.9	1.0	2.0	2.3	†12.9	3.6	2.9	1.8	1.0	0.2	3.0	2.8
21	4.3	0.9	2.3	2.3	10.0	3.1	2.8	2.0	0.9	0.2	2.8	3.4
22	4.0	1.1	2.1	2.3	6.5	2.8	3.0	2.1	1.8	0.1	2.5	3.0
23	3.0	1.2	2.3	2.3	5.4	2.5	2.9	2.9	2.0	0.1	2.3	2.6
24	3.5	1.1	2.3	2.3	4.2	2.3	3.1	3.4	3.0	0.1	1.8	2.0
25	6.8	0.9	2.3	2.3	3.8	2.2	2.8	3.2	2.1	0.2	1.5	1.8
26	6.3	0.9	2.3	2.3	4.0	2.0	2.5	3.7	2.0	0.4	1.1	1.5
27	5.6	1.2	2.3	2.3	3.4	1.9	2.7	3.2	1.9	0.4	0.9	1.3
28	7.2	1.4	2.3	2.3	4.3	1.8	2.8	3.7	1.8	0.6	1.0	1.1
29	6.6	1.4	2.3	2.3	-------	1.6	2.5	3.5	1.8	0.6	2.5	1.0
30	6.9	1.6	2.3	2.3	-------	1.6	2.5	3.9	1.8	1.0	2.0	1.0
31	6.4	-------	2.3	2.3	-------	1.5	-------	3.8	-------	1.0	2.0	-------

NOTES—*River frozen December 11, 1917 to February 13,1918 **Chain stolen;gage heights estimated July 18 to September 30, 1918. †Maximum 16.0 at 3:00 p. m. estimated from hydrograph.

OHIO BASIN—STATION NO. 12

RED BANK CREEK AT SAINT CHARLES

DESCRIPTION OF STATION

Location—At single span, through truss bridge at Saint Charles, Clarion County.

Records Available—Discharge complete from October 30, 1909, to September 30, 1916, and discharge measurements and gage heights from October 1, 1916, to September 30, 1918.

Drainage Area—540 square miles.

Gage—A standard chain gage, whose elevation of zero is 976.24 feet above mean sea level, is located on the upstream side of the bridge and is read twice daily by Forest Bish.

Channel—The right bank overflows at extreme stages, the left is high and does not overflow, and the bed is composed of large rocks.

Discharge Measurements of Red Bank Creek at Saint Charles, Clarion County
(Drainage area, 540 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
18	May 1	Wilson	323	1.80	242	Multiple point method
19	July 25	Wilson	317	1.98	351	0.2 & 0.8 method
20	Nov. 23	Wilson	277	1.71	224	0.2 & 0.8 method
21	Dec. 19	Wilson	109	2.25	161	Under ice cover
	1918					
22	Jan. 2	Wilson	222	3.46	279	Under ice cover

Daily Mean Gage Heights, in feet, of Red Bank Creek at Saint Charles, Clarion County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.19	1.86	2.8	3.0	4.4	3.5	3.1	1.83	4.3	2.1	2.0	2.0
2	1.17	1.80	2.6	2.8	4.1	3.1	3.0	1.63	3.9	2.2	1.85	1.70
3	1.24	1.76	2.5	2.8	3.8	3.0	3.0	1.83	3.6	1.98	1.95	1.60
4	1.17	1.86	2.4	3.0	3.5	2.7	3.1	2.0	3.4	2.2	1.90	1.85
5	1.11	1.80	2.3	3.2	3.3	2.2	3.3	2.3	3.7	2.1	1.95	2.0
6	1.07	1.70	2.1	5.7	2.9	2.2	3.3	2.1	3.9	2.1	1.95	2.1
7	‡1.01	1.66	2.2	4.7	2.6	2.2	3.2	2.1	4.1	2.0	1.75	1.75
8	1.11	1.60	2.2	4.2	2.5	2.8	3.1	1.93	4.4	2.1	1.95	1.55
9	1.21	1.60	2.2	3.4	2.4	2.7	3.0	2.0	4.3	2.2	2.2	1.85
10	1.17	1.70	2.1	3.6	2.2	2.9	2.8	1.83	4.0	2.3	2.4	2.0
11	1.21	1.76	2.2	3.0	2.0	3.2	2.8	1.77	3.8	2.5	2.4	1.95
12	1.17	1.66	2.2	2.8	2.0	†6.5	2.8	1.83	3.9	2.2	2.8	2.2
13	1.21	1.60	2.1	2.6	2.0	5.0	2.6	2.0	3.7	2.2	2.4	1.90
14	1.11	1.86	1.96	2.4	1.95	4.2	2.4	2.3	3.5	2.4	2.2	1.75
15	1.27	1.20	1.90	2.5	1.92	3.8	2.4	2.1	3.5	2.1	2.0	1.90
16	1.44	1.53	2.0	2.4	1.89	3.5	2.3	2.1	3.1	2.0	2.2	1.75
17	1.41	1.86	1.96	2.4	1.89	3.7	2.1	1.85	1.92	2.3	2.2	2.1
18	1.47	1.86	2.0	2.4	1.99	3.9	2.1	1.93	1.69	2.1	2.2	2.0
19	1.69	1.90	*1.90	2.4	2.1	3.9	2.2	1.80	1.89	1.95	2.3	1.85
20	3.7	1.80	1.76	2.3	2.8	3.4	2.1	1.83	1.66	2.2	2.0	1.80
21	3.6	1.76	1.80	2.4	2.6	4.3	2.2	2.0	1.74	2.2	2.2	2.1
22	3.3	1.70	1.86	5.1	2.4	3.7	2.1	1.95	1.79	2.1	2.2	1.95
23	3.2	2.9	2.0	4.8	3.2	3.5	2.3	1.80	1.99	2.0	2.5	1.75
24	3.1	2.8	2.1	4.4	3.6	3.8	1.96	1.85	2.1	2.3	2.4	1.90
25	2.8	2.7	2.2	4.0	3.8	3.9	1.86	2.1	2.2	1.98	2.4	1.55
26	2.5	2.6	2.2	3.8	4.1	3.6	2.3	2.1	2.1	2.2	2.2	1.80
27	2.4	2.5	2.3	3.6	5.9	3.6	1.94	2.6	2.2	1.95	2.1	2.0
28	2.3	2.4	6.2	3.4	4.4	3.7	2.0	3.2	1.99	2.0	2.2	1.75
29	2.1	2.6	4.6	3.4	-------	3.5	1.81	4.6	2.1	1.95	1.90	1.75
30	1.97	2.9	3.9	3.3	-------	3.4	1.64	4.4	1.89	2.1	1.60	2.0
31	1.81	-------	3.4	3.4	-------	3.3	-------	4.8	-------	2.0	1.95	-------

NOTES—*Creek frozen December 19 to 28, 1916, inclusive. †Maximum 7.7 feet at 6 a. m. estimated from hydrograph. ‡Minimum 0.99 feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.95	5.0	1.70	3.4	2.8	6.6	1.87	2.1	5.0	2.1	0.77	0.57
2	2.0	4.7	1.75	3.2	2.8	6.4	1.91	2.1	5.3	2.0	0.64	0.57
3	2.2	4.6	1.82	3.4	2.9	5.9	2.0	1.97	4.9	1.91	0.61	0.64
4	1.90	4.6	1.85	3.2	3.0	5.5	2.0	1.87	4.6	1.79	0.71	0.81
5	1.65	4.0	1.72	3.2	3.2	5.0	2.0	1.91	4.1	1.77	0.81	0.77
6	1.95	3.6	1.62	3.3	3.2	4.6	1.91	1.87	4.1	1.70	0.77	0.69
7	2.2	3.2	1.52	3.4	3.4	4.0	2.0	1.81	4.0	1.67	0.71	0.64
8	2.3	2.4	*1.58	3.0	3.5	3.9	2.3	1.87	3.4	1.57	0.61	0.67
9	2.0	2.0	1.55	3.2	3.6	3.8	2.4	1.91	3.1	1.54	0.51	0.87
10	1.85	2.2	1.62	3.4	5.0	3.7	2.5	1.77	2.7	1.41	0.51	1.21
11	1.80	2.6	2.1	3.4	4.8	3.5	2.5	1.81	2.8	1.44	0.81	1.14
12	2.1	2.2	2.0	3.2	8.0	3.6	2.5	2.0	2.9	1.41	0.94	0.94
13	2.3	1.90	1.95	3.4	9.4	3.8	2.6	3.0	2.6	1.31	0.84	0.89
14	2.0	2.0	1.72	3.2	7.3	8.1	2.1	3.3	2.6	1.31	0.71	0.74
15	1.75	2.2	2.0	3.2	6.8	8.1	2.3	3.1	2.4	1.27	0.77	0.94
16	1.75	2.0	1.95	3.2	6.2	6.3	3.3	3.0	2.5	1.21	0.69	1.14
17	1.90	1.90	2.0	3.2	5.3	4.9	3.2	2.9	2.5	1.21	0.61	1.41
18	2.2	1.80	2.1	3.2	4.8	3.9	3.3	3.0	2.4	1.11	0.71	1.39
19	2.4	2.0	2.2	3.1	5.7	3.4	3.3	3.2	2.3	1.11	0.79	1.27
20	2.7	2.2	2.0	3.0	†11.5	3.3	3.0	3.4	2.2	1.14	0.99	1.17
21	3.0	2.0	2.4	3.0	9.1	3.2	3.0	3.5	2.4	0.94	1.14	1.04
22	3.0	2.0	2.9	3.0	8.2	3.2	3.0	3.4	3.0	0.84	0.97	1.0[illegible]
23	3.8	1.80	2.6	3.2	7.3	3.1	2.9	3.4	2.7	0.71	0.77	0.97
24	4.8	2.0	3.9	3.0	6.8	2.9	3.0	3.2	2.5	0.67	0.77	0.84
25	6.8	2.1	4.0	3.2	6.6	2.6	2.8	3.1	2.3	0.69	0.77	0.89
26	6.6	1.80	4.2	3.0	6.3	2.3	2.6	3.2	2.2	0.57	0.71	0.77
27	6.4	1.90	4.1	3.0	5.9	2.2	2.4	3.4	2.0	0.59	0.64	0.77
28	6.0	1.85	4.0	2.8	6.9	2.0	2.3	4.1	2.0	0.54	0.59	0.71
29	6.0	2.2	4.0	2.7	-------	1.90	2.2	4.3	2.1	0.71	0.51	0.67
30	5.6	1.85	4.1	2.8	-------	1.72	2.1	4.4	2.2	0.67	0.51	0.71
31	5.2	-------	3.9	2.7	-------	1.82	-------	4.2	-------	0.81	‡0.47	-------

NOTES—*Gage heights affected by ice December 8, 1917 to February 13, 1918. †Maximum 12.2 feet from hydrograph at 5 a. m. ‡Minimum 0.44 foot.

OHIO BASIN—STATION NO 13

MAHONING CREEK NEAR DAYTON

DESCRIPTION OF STATION

Location—At single span, through truss, highway bridge, known as Independence Bridge, near Dayton, Armstrong County.

Records Available—Discharge measurements and gage heights from August 12, 1916, to September 30, 1918.

Drainage Area—322 square miles.

Gage—A standard chain gage, whose elevation of zero is arbitrary, is located on the downstream handrail and is read twice daily by J. T. Mathews.

Channel—Both banks are high and not subject to overflow and the bed is composed of small boulders and gravel.

Discharge Measurements of Mahoning Creek near Dayton, Armstrong County
(Drainage area, 322 square miles)

No.	Date	Hydrographer	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
2	May 3	Wilson	272	2.28	183	Multiple point method
3	May 19	Wilson	272	2.33	209	0.2 & 0.8 method
4	July 13	Wilson	451	3.62	1,073	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Mahoning Creek near Dayton, Armstrong County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	2.04	2.13	3.62	3.21	4.90	3.20	3.19	2.38	3.37	2.86	2.10	2.45
2	1.94	2.18	3.32	3.01	4.00	2.95	3.14	2.33	3.17	2.96	2.00	2.25
3	1.89	2.08	3.02	3.06	3.65	2.80	3.39	2.28	3.17	2.86	1.95	2.20
4	1.84	2.03	2.92	3.71	*3.35	2.40	3.04	2.18	2.97	2.56	1.90	2.15
5	1.84	2.23	2.82	4.21	3.00	2.50	3.09	2.48	2.92	2.36	1.90	2.00
6	1.79	2.28	2.82	5.51	3.10	2.45	4.44	3.08	3.32	2.31	1.90	2.45
7	1.79	2.13	2.62	4.41	3.35	2.80	4.34	2.98	4.22	2.26	1.90	2.75
8	1.79	2.03	2.52	3.86	3.40	3.20	4.24	2.98	4.47	2.36	1.95	3.90
9	1.79	2.08	2.52	3.51	3.35	3.20	3.89	3.18	3.87	3.11	2.55	3.50
10	1.79	2.23	2.62	3.41	3.35	2.90	3.54	3.28	3.47	3.16	2.40	2.95
11	1.79	2.43	2.47	3.16	3.00	3.90	3.19	3.03	3.52	3.21	2.15	2.60
12	1.74	2.33	*2.47	*3.91	2.75	†6.15	3.09	2.78	3.17	2.99	2.00	2.35
13	1.89	2.28	2.32	5.96	2.65	4.55	2.99	2.73	2.92	3.57	2.15	2.25
14	2.14	2.33	2.57	6.96	2.45	4.15	2.84	2.48	2.82	3.20	4.40	2.15
15	2.09	2.48	2.87	7.01	2.25	4.75	2.69	2.43	2.62	3.35	3.95	2.00
16	1.99	2.38	2.82	7.06	2.35	3.65	2.49	2.38	2.62	3.20	3.20	2.15
17	1.89	2.28	2.77	6.61	2.15	3.85	2.34	2.38	2.62	3.65	2.90	2.00
18	1.99	2.28	2.67	6.51	3.35	4.20	2.14	2.38	2.42	3.50	2.65	2.00
19	2.64	2.23	2.67	6.41	3.75	3.70	2.49	2.33	2.37	4.80	2.40	2.00
20	3.69	2.18	2.67	6.21	4.50	3.20	2.79	2.28	2.22	3.60	2.20	2.05
21	3.99	2.18	2.57	6.01	4.65	3.40	2.74	2.38	2.22	3.30	2.15	1.95
22	3.24	2.18	2.82	6.26	4.35	3.55	2.59	2.33	2.22	3.05	2.20	2.00
23	2.84	2.18	3.22	5.61	4.15	3.60	2.49	2.28	2.12	2.90	2.20	1.90
24	2.64	3.08	3.12	4.11	5.90	5.30	2.44	2.38	2.62	2.70	2.60	1.80
25	2.54	3.13	3.02	3.71	5.35	4.55	2.39	2.28	2.32	2.50	2.55	‡1.75
26	2.59	2.78	2.92	3.16	4.65	4.00	2.49	2.23	2.37	2.45	2.15	1.80
27	2.34	2.83	3.22	2.91	5.20	3.65	2.59	2.23	4.37	2.40	2.10	1.80
28	2.29	2.73	5.57	*3.41	3.50	3.85	2.44	2.48	3.47	2.35	2.00	‡1.75
29	2.19	3.58	4.42	2.91	-------	3.65	2.34	3.38	3.47	2.25	2.00	‡1.80
30	2.09	3.93	3.72	3.66	-------	3.55	2.34	3.28	3.17	2.20	2.50	1.85
31	2.09	-------	3.37	4.06	-------	3.35	-------	3.08	-------	2.15	3.10	-------

NOTES—*Creek frozen December 12 to 28, 1916; January 12 to 22; January 28 and February 4 to 27, 1917, inclusive. †Maximum 6.80 feet at 1 a. m. estimated from hydrograph. ‡Minimum 1.70 feet September 25, 28 and 29, 1917.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.75	3.65	2.25	3.35	1.60	3.85	2.05	2.55	3.90	2.00	2.15	3.55
2	1.80	3.35	2.40	3.35	1.60	4.15	2.20	2.45	3.45	2.00	1.95	2.70
3	1.80	3.00	2.25	2.80	1.60	3.75	2.25	2.40	3.15	1.85	1.80	2.50
4	2.40	3.00	2.20	2.50	1.60	3.45	2.40	2.40	3.25	1.90	1.95	2.30
5	2.30	2.85	2.20	2.50	1.50	3.65	2.35	2.35	2.95	1.70	3.95	2.25
6	2.10	2.75	2.15	2.60	1.60	3.65	2.25	2.40	2.80	‡1.55	2.85	2.35
7	2.05	2.65	2.20	2.80	1.70	3.90	2.25	2.30	4.20	1.85	2.35	2.30
8	1.90	2.55	2.15	2.55	2.00	3.55	2.25	2.40	3.65	1.80	5.25	2.10
9	1.85	2.45	*2.40	2.50	3.15	3.50	2.75	2.25	3.15	1.80	3.90	2.00
10	1.65	2.45	2.55	2.20	4.15	4.95	2.80	2.25	2.95	1.80	4.40	2.00
11	1.80	2.40	2.50	2.20	4.50	4.15	2.75	2.30	3.10	1.80	3.55	1.95
12	2.25	2.40	2.45	2.35	5.05	3.90	2.90	2.40	2.95	1.75	3.45	2.05
13	2.55	2.35	2.50	2.05	6.85	3.65	3.05	2.65	3.40	1.90	3.10	4.60
14	2.30	2.25	2.60	2.10	5.55	5.45	4.35	3.60	2.70	1.90	2.75	3.30
15	2.50	2.20	2.60	2.10	6.95	5.80	4.70	3.15	2.55	1.80	3.25	2.95
16	2.80	2.25	2.45	2.00	5.05	4.50	4.15	2.90	2.25	1.80	2.70	3.00
17	2.70	2.30	2.60	2.05	4.10	4.00	3.80	2.70	2.50	1.75	2.50	3.85
18	2.60	2.20	2.50	2.00	3.40	3.60	4.05	2.60	2.60	1.70	2.35	3.80
19	3.99	2.25	2.60	1.95	3.90	3.25	3.65	2.45	2.30	1.80	2.25	3.60
20	5.76	2.10	2.70	1.90	†9.00	3.10	3.35	2.45	2.25	1.70	2.20	3.45
21	4.30	2.15	2.80	1.90	5.55	2.90	3.25	2.45	2.30	1.70	2.10	3.10
22	3.70	2.20	3.45	1.70	4.15	2.75	3.35	2.60	3.00	1.70	2.10	3.10
23	3.30	2.25	3.80	1.55	3.65	2.70	3.10	3.05	2.70	1.60	2.00	2.80
24	4.15	2.10	3.80	1.85	3.40	2.60	2.95	2.80	2.45	1.80	2.00	2.70
25	5.50	2.15	4.55	1.55	3.50	2.60	2.80	2.70	2.30	2.55	1.85	2.55
26	5.30	2.15	4.20	1.40	6.75	2.55	2.65	4.70	2.25	2.35	1.95	2.60
27	4.95	2.25	4.05	1.40	4.60	2.45	2.60	4.05	2.20	1.95	1.80	2.50
28	5.10	2.20	3.70	1.35	3.60	2.35	2.55	4.05	2.15	1.85	2.10	2.40
29	4.55	2.00	3.50	1.25	-------	2.35	2.50	4.05	2.10	1.80	2.80	2.25
30	4.15	2.25	3.35	1.55	-------	2.25	2.55	5.40	2.10	2.40	2.45	2.25
31	3.55	-------	3.45	1.60	-------	2.20	-------	4.55	-------	2.70	2.80	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 13, 1918. †Maximum 9.6 feet from hydrograph at 1 p. m. ‡Minimum 1.5 feet.

OHIO BASIN—STATION NO. 14

ALLEGHENY RIVER AT KITTANNING

DESCRIPTION OF STATION

Location—At five span, steel, through truss, highway bridge at Market Street, Kittanning, Armstrong County.

Records Available—Discharge complete from August 18, 1904, to September 30, 1918. For other records on this river see Allegheny River at Larabee, Franklin and Freeport; also Allegheny River at Red House, N. Y., in the 1911 to 1914 reports of the Water Supply Commission.

Drainage Area—9,010 square miles.

Gage—A standard chain gage, whose elevation of zero is 764.45 feet above mean sea level, is located on the upstream side of the bridge and is read twice daily by S. C. Carr.

Channel—Both banks are high, clean and do not overflow, and the bed is composed of gravel.

Discharge Measurements of Allegheny River at Kittanning, Armstrong County
(Drainage area, 9,010 square miles)

No.	Date	Hydrographer	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
47	July 10	Wilson	6,815	8.19	24,061	Surface method
48	July 12	Wilson	8,717	10.41	38,758	Surface method

Daily Mean Gage Heights, in feet, of Allegheny River at Kittanning, Armstrong County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.7	2.6	9.8	7.2	7.7	10.7	9.1	4.5	11.1	8.0	4.2	3.4
2	1.7	2.5	8.7	6.6	8.3	10.0	8.8	4.5	12.0	7.0	4.2	3.4
3	1.6	2.6	7.4	6.2	7.4	8.7	9.5	4.4	10.8	9.0	3.8	3.3
4	1.6	2.7	6.5	6.6	6.3	7.8	9.7	4.4	9.4	9.1	3.6	3.3
5	1.6	2.9	5.9	7.6	5.7	7.1	8.9	4.9	8.3	7.9	3.4	3.6
6	1.6	2.9	5.8	13.6	5.1	6.1	8.9	6.3	8.2	6.7	3.2	4.3
7	‡1.5	2.7	5.9	13.3	5.0	5.5	10.1	8.2	10.2	5.9	3.0	4.0
8	1.5	2.6	5.5	11.6	5.3	5.8	10.1	8.6	13.4	5.4	2.9	4.4
9	1.5	2.5	5.1	10.2	5.2	6.9	9.8	8.5	13.4	6.2	3.0	4.6
10	1.5	2.5	5.1	9.0	5.0	6.9	8.9	7.9	12.6	7.8	3.0	3.8
11	1.5	2.8	5.0	8.8	*	7.3	8.1	8.0	12.4	9.6	3.0	3.4
12	1.5	3.3	4.9	7.8	-------	13.7	7.5	7.5	12.1	10.5	2.9	3.2
13	1.5	3.6	5.0	6.0	-------	15.5	7.0	6.9	10.4	10.0	2.9	3.0
14	1.7	3.5	4.6	5.6	-------	13.6	6.8	6.4	9.0	9.2	3.8	2.8
15	1.9	3.4	4.1	5.0	-------	13.6	6.6	6.0	8.0	10.4	4.6	2.7
16	2.2	3.7	3.2	4.4	-------	12.0	6.1	5.6	7.2	9.9	6.4	2.5
17	2.6	3.9	2.8	*	-------	10.9	5.7	5.2	6.6	8.8	5.2	2.4
18	2.6	3.8	2.8	-------	-------	11.6	5.5	5.0	6.0	8.0	5.0	2.4
19	2.7	3.7	3.2	-------	-------	11.4	5.5	4.8	5.6	7.5	4.8	2.3
20	3.7	3.5	4.0	-------	-------	10.1	5.5	4.9	5.3	6.9	4.5	2.2
21	4.8	3.3	3.8	-------	-------	9.2	6.0	5.7	5.0	6.6	4.0	2.2
22	5.1	3.3	3.8	-------	-------	9.1	6.0	7.0	4.7	6.4	3.6	2.0
23	5.0	3.5	4.3	-------	-------	9.0	5.6	8.3	4.4	6.2	4.4	2.0
24	4.4	4.1	4.5	-------	-------	10.8	5.4	8.9	4.6	6.0	4.6	2.0
25	3.9	5.7	4.4	-------	-------	13.5	5.1	8.6	5.4	5.4	4.5	2.0
26	3.4	7.4	4.4	-------	-------	12.5	5.0	8.9	6.0	5.1	4.1	1.9
27	3.1	6.5	4.8	-------	-------	11.1	5.0	8.7	7.1	5.0	3.7	1.9
28	2.9	5.7	8.4	-------	†13.2	10.7	4.9	8.2	11.2	5.7	3.4	1.9
29	2.9	5.9	9.0	-------	-------	10.5	4.8	10.4	10.2	5.9	3.1	1.9
30	2.7	8.2	8.6	-------	-------	10.3	4.6	11.9	9.2	5.0	3.1	1.9
31	2.5	-------	7.8	7.2	-------	9.8	-------	11.1	-------	4.5	3.2	-------

NOTES—*River frozen January 17 to 30 and February 11 to 27, 1917 inclusive. †Maximum 16.9 feet at 8 p. m. estimated from hydrograph. ‡Minimum 1.48 feet October 7 to 13, 1916, inclusive.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.0	16.0	4.0	*4.6	3.6	12.7	4.9	5.2	6.9	4.4	3.4	2.4
2	2.0	13.5	4.3	6.5	3.6	13.1	4.8	5.0	6.3	4.2	3.4	2.7
3	2.1	11.2	5.2	6.3	3.6	12.8	4.7	4.8	5.6	4.1	3.0	2.4
4	2.6	9.8	5.2	6.3	3.6	11.6	4.8	4.7	5.1	4.0	2.6	2.4
5	3.2	8.8	4.8	6.3	3.6	10.7	5.3	4.5	5.2	3.6	2.3	2.5
6	3.5	7.8	4.6	6.2	3.4	10.7	5.2	4.4	4.9	3.3	3.0	2.8
7	3.7	7.0	4.2	6.2	3.4	11.2	5.0	4.3	5.1	3.1	2.6	3.2
8	3.7	6.5	4.0	6.0	3.4	11.2	4.9	4.3	5.4	2.9	4.0	3.6
9	3.4	6.0	*4.0	6.0	3.7	10.5	5.7	4.2	5.0	2.7	3.8	3.4
10	3.2	5.7	3.8	5.6	4.5	10.4	6.2	4.3	4.5	2.6	4.0	3.0
11	3.0	5.4	3.2	5.6	5.0	13.0	6.1	4.6	4.4	2.5	4.2	2.7
12	3.1	5.2	3.2	5.2	5.8	11.8	6.0	5.6	4.1	2.5	4.1	2.4
13	3.4	5.0	3.4	4.8	12.8	10.6	6.3	6.0	4.4	2.5	3.8	2.8
14	3.6	4.8	3.5	4.8	10.9	13.4	6.7	9.4	5.7	2.5	3.4	3.6
15	3.8	4.6	3.7	4.6	15.5	22.4	7.8	9.2	5.0	2.5	3.4	4.2
16	4.1	4.4	3.7	4.6	14.3	19.1	8.0	7.8	4.5	2.5	3.2	3.9
17	4.6	4.4	3.7	4.6	12.0	16.0	7.8	6.9	4.1	2.4	3.1	4.2
18	4.7	4.3	3.7	4.6	10.4	13.2	7.7	6.2	3.8	2.3	2.8	5.4
19	4.8	4.2	3.7	4.5	9.5	11.1	8.1	5.6	4.0	2.1	2.6	6.0
20	9.0	4.1	3.7	4.4	†20.5	9.7	7.9	5.2	3.6	2.0	2.4	5.7
21	9.8	4.0	3.7	4.4	20.8	8.8	7.3	5.3	3.4	2.0	2.4	5.5
22	9.2	4.0	3.9	4.2	14.8	8.0	7.0	6.0	3.8	1.9	2.4	5.8
23	7.8	4.0	4.2	4.0	12.3	7.6	6.8	6.8	8.2	1.9	2.2	6.1
24	8.2	4.3	5.4	4.0	11.1	7.1	6.8	7.1	7.1	1.8	1.8	5.8
25	12.9	4.6	6.4	4.0	10.1	6.7	6.9	6.6	6.4	2.0	1.8	5.2
26	14.0	4.5	6.2	3.6	11.2	6.3	6.6	7.2	5.7	2.6	1.8	4.7
27	13.2	4.2	6.4	3.6	12.6	6.1	6.1	7.2	5.1	2.6	1.8	4.6
28	14.2	3.6	6.4	3.6	11.4	5.8	5.9	8.0	4.6	3.2	‡1.6	4.6
29	14.7	3.6	5.9	3.6	-------	5.4	5.6	7.6	4.3	2.8	1.9	4.6
30	16.2	3.8	5.2	3.6	-------	5.3	5.5	7.9	4.0	2.7	2.2	4.4
31	18.0	-------	4.5	3.6	-------	5.1	-------	7.6	-------	2.9	2.2	-------

NOTES—*Gage heights affected December 9, to 25, 1917; January 1, to February 13, 1918. †Maximum 24.0 feet from hydrograph at midnight. ‡Minimum 1.6 feet.

Daily Discharge, in second-feet, of Allegheny River at Kittanning, Armstrong County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1,220	2,640	37,200	20,200	23,300	43,600	32,400	7,260	46,400	25,200	6,380	4,390
2	1,220	2,440	29,700	16,800	27,100	38,600	30,400	7,260	53,000	19,000	6,380	4,390
3	1,100	2,640	21,400	14,800	21,400	29,700	35,100	6,960	44,300	31,700	5,340	4,160
4	1,100	2,850	16,200	16,800	15,300	23,900	36,500	6,960	34,400	32,400	4,850	4,160
5	1,100	3,270	13,300	22,600	12,400	19,600	31,000	8,780	27,100	24,500	4,390	4,850
6	1,100	3,270	12,800	65,700	9,640	14,300	31,000	15,300	26,400	17,300	3,940	6,660
7	‡990	2,850	13,300	63,200	9,200	11,400	39,300	26,400	40,000	13,300	3,490	5,840
8	990	2,640	11,400	50,000	10,500	12,800	39,300	29,000	64,000	11,000	3,270	6,960
9	990	2,440	9,640	40,000	10,100	18,400	37,200	28,400	64,000	14,800	3,490	7,600
10	990	2,440	9,640	31,700	9,200	18,400	31,000	24,500	57,600	23,900	3,490	5,340
11	990	3,060	9,200	30,400	*7,600	20,800	25,800	25,200	56,100	35,800	3,490	4,390
12	990	4,160	8,780	20,800	6,950	66,500	22,000	22,000	53,800	42,200	3,270	3,940
13	990	4,850	9,200	13,800	5,840	82,400	19,000	18,400	41,400	38,600	3,270	3,490
14	1,220	4,620	7,600	11,900	5,400	65,700	17,800	15,800	31,700	33,000	5,340	3,060
15	1,460	4,390	6,100	9,200	5,340	60,800	16,800	13,800	25,200	41,400	7,600	2,850
16	1,920	5,080	3,940	6,960	5,080	53,000	14,300	11,900	20,200	37,900	15,800	2,440
17	2,640	5,580	3,060	*6,240	4,960	45,000	12,400	10,100	16,800	30,400	10,100	2,260
18	2,640	5,340	3,060	5,840	5,580	50,000	11,400	9,200	13,800	25,200	9,200	2,260
19	2,850	5,080	3,940	5,340	6,660	48,600	11,400	8,380	11,900	22,000	8,380	2,080
20	5,080	4,620	5,840	5,080	7,980	39,300	11,400	8,780	10,500	18,400	7,260	1,920
21	8,330	4,160	5,340	4,850	10,500	33,000	13,800	12,400	9,200	16,800	5,840	1,920
22	9,640	4,160	5,340	6,100	11,400	32,400	13,800	19,000	7,980	15,800	4,850	1,600
23	9,200	4,620	6,660	11,400	12,400	31,700	11,900	27,100	6,960	14,800	7,600	1,600
24	6,960	6,100	7,260	9,640	15,800	44,300	11,000	31,000	7,600	13,800	7,600	1,600
25	5,580	12,400	6,960	10,100	17,800	64,900	9,640	29,000	11,000	11,000	7,260	1,600
26	4,390	21,400	6,960	9,200	20,200	56,800	9,200	31,000	13,800	9,640	6,100	1,460
27	3,720	16,200	8,380	7,980	23,300	46,400	9,200	29,700	19,600	9,200	5,080	1,460
28	3,270	12,400	27,800	7,260	†62,400	43,600	8,780	26,400	47,100	12,400	4,390	1,460
29	3,270	13,300	31,700	8,780	-------	42,200	8,380	41,400	40,000	13,300	3,720	1,460
30	2,850	26,400	29,000	11,900	-------	40,700	7,600	52,300	33,000	9,200	3,720	1,460
31	2,440	-------	23,900	20,200	-------	37,200	-------	46,400	-------	7,260	3,940	-------

NOTES—*River frozen January 17 to 30, and February 11 to 27, 1917, inclusive, and discharge estimated from climatological data. †Maximum=95,600 second-feet. ‡Minimum = 968 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917 1918												
1	1,600	87,000	5,840	*3,970	1,600	58,400	8,780	10,100	18,400	6,960	4,390	2,260
2	1,600	64,900	6,660	5,460	1,600	78,800	8,380	9,200	15,300	6,380	4,390	2,850
3	1,760	47,100	10,100	5,080	1,600	59,200	7,980	8,380	16,800	6,100	3,490	2,260
4	2,640	37,200	10,100	4,850	1,660	50,000	8,380	7,980	9,640	5,840	2,640	2,260
5	3,940	30,400	8,380	4,740	1,600	43,600	10,500	7,260	10,100	4,850	2,080	2,440
6	4,620	23,900	7,600	4,620	1,460	43,600	10,100	6,960	8,780	4,160	3,490	3,060
7	5,080	19,000	6,380	4,620	1,340	47,100	9,200	6,660	9,640	3,720	2,640	3,940
8	5,080	16,200	5,840	4,620	1,340	47,100	8,780	6,660	11,000	3,270	5,840	4,850
9	4,390	13,800	*4,050	4,620	1,600	42,200	12,400	6,380	9,200	2,850	5,340	4,390
10	3,940	12,400	2,640	4,390	2,170	41,400	14,800	6,660	7,260	2,640	5,840	3,490
11	3,490	11,000	1,920	3,940	3,060	60,800	14,300	7,600	6,960	2,440	6,380	2,850
12	3,720	10,100	1,920	3,490	4,280	51,500	13,800	11,900	6,100	2,440	6,100	2,260
13	4,390	9,200	2,170	3,380	19,600	42,900	15,300	13,800	6,960	2,440	5,340	3,060
14	4,850	8,280	2,350	2,960	45,000	64,600	17,300	24,400	12,400	2,440	4,390	4,850
15	5,340	7,600	2,440	2,740	82,400	157,000	23,900	33,000	9,200	2,440	4,390	6,380
16	6,100	6,960	2,440	2,540	71,700	119,000	25,200	23,900	7,260	2,440	3,940	5,580
17	7,600	6,960	2,440	2,440	53,000	87,000	23,900	18,400	6,100	2,260	3,720	6,380
18	7,980	6,660	2,440	2,440	41,400	62,400	23,300	14,800	5,340	2,080	3,060	11,000
19	8,380	6,380	2,540	2,350	35,100	46,400	25,800	11,900	5,840	1,760	2,640	13,800
20	31,700	6,100	2,540	2,260	†134,000	36,500	24,500	10,100	4,850	1,600	2,260	12,400
21	37,200	5,840	2,540	2,170	138,000	30,400	20,800	10,500	4,390	1,600	2,260	11,400
22	33,000	5,840	2,740	2,080	76,200	25,200	19,000	13,800	5,340	1,460	2,260	12,800
23	28,900	5,840	3,160	1,920	55,300	22,600	17,800	17,800	26,400	1,460	1,920	14,300
24	26,400	6,660	4,390	1,840	46,400	19,600	17,800	19,600	19,600	1,340	1,340	12,800
25	60,000	7,600	7,600	1,760	39,300	17,300	18,400	16,800	15,800	1,600	1,240	10,100
26	69,100	7,260	14,800	1,680	47,100	15,300	16,800	20,200	12,400	2,640	1,340	7,980
27	62,400	6,380	15,800	1,600	57,600	14,300	14,300	20,200	9,640	2,640	1,340	7,600
28	70,800	4,850	15,800	1,600	48,600	12,800	13,300	25,200	7,600	3,940	‡1,100	7,600
29	75,300	4,850	13,300	1,000	1,600	11,000	11,900	22,600	6,600	3,060	1,460	7,600
30	88,900	5,340	10,100	1,600	-------	10,500	11,400	24,500	5,840	2,850	1,920	6,960
31	107,000	-------	7,260	1,600	-------	9,640	-------	22,600	-------	3,270	1,920	-------

NOTES—*Gage heights affected by ice December 9 to 25, 1917; January 1 to February 13, 1918, and discharge estimated from climatological data. †Maximum 177,000 second-feet from hydrograph at midnight. ‡Minimum 1,100 second-feet.

Estimated Monthly Discharge of Allegheny River at Kittanning, Armstrong County
(Drainage Area, 9,010 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	9,640	‡990	2,940	0.33	0.38
November	26,400	2,440	6,510	0.72	0.80
December	37,200	3,060	12,700	1.41	1.63
January	65,700	----------	18,200	2.02	2.33
February	†62,400	----------	13,720	1.52	1.58
March	82,400	11,400	39,900	4.43	5.11
April	39,300	7,600	20,300	2.25	2.51
May	52,300	6,960	21,000	2.33	2.69
June	64,000	6,960	31,200	3.46	3.86
July	42,200	7,260	21,700	2.41	2.78
August	15,800	3,270	6,810	0.64	0.74
September	7,600	1,460	3,290	0.37	0.41
The year	82,400	990	16,500	1.83	24.82

NOTES—River frozen January 17 to 30, and February 11 to 27, 1917, inclusive, and discharge estimated from climatological data. †Maximum=95,600 second-feet, February 28, 1917. ‡ Minimum=968 second-feet, October 7, 1916.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	107,000	1,600	24,900	2.76	3.18
November	87,000	4,850	16,400	1.82	2.03
December	15,800	----------	6,070	0.67	0.77
January	----------	----------	3,130	0.35	0.40
February	138,000	----------	36,200	4.02	4.19
March	157,000	9,640	46,000	5.11	5.89
April	25,800	7,980	15,600	1.73	1.93
May	34,400	6,380	15,200	1.69	1.95
June	26,400	4,390	10,000	1.11	1.24
July	6,960	1,340	3,060	0.34	0.39
August	6,380	1,100	3,240	0.36	0.42
September	14,300	2,260	6,650	0.74	0.83
The year	157,000	1,100	15,400	1.71	23.22

NOTES—Gage heights affected by ice December 9 to 25, 1917; January 1 to February 13, 1918, and discharge estimated from climatological data. Maximum 177,000 second-feet at midnight February 20. Minimum 1,100 second-feet August 28.

OHIO BASIN—STATION NO. 15

CROOKED CREEK AT HILEMAN'S FARM, ARMSTRONG COUNTY

DESCRIPTION OF STATION

Location—At single span, steel, through truss, highway bridge, about three miles above the mouth, near Ford City, Armstrong County.

Records Available—Discharge complete from October 16, 1909, to September 30, 1918.

Drainage Area—279 square miles.

Gage—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge and is read twice daily by Floy Spang.

Channel—Both banks are high and not subject to overflow, and the bed is composed of rock, the section being deep and the current sluggish.

Discharge Measurements of Crooked Creek at Hileman's Farm, Armstrong County
(Drainage area, 279 square miles)

No.	Date	Hydrographer	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
20	May 2	Wilson	280	1.72	76	Multiple point method.
21	July 11	Wilson	649	4.29	1,408	0.2 & 0.8 method.
	1918					
22	Jan. 3	Wilson	150	2.10	77	Under ice cover.

Daily Mean Gage Heights, in feet, of Crooked Creek at Hileman's Farm, Armstrong County for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	2.0	1.35	3.0	2.5	4.1	3.9	2.2	1.78	2.3	1.68	1.58	1.33
2	1.85	1.45	2.6	2.3	4.5	3.8	2.1	1.68	2.6	1.68	1.53	1.28
3	1.80	1.50	2.5	2.6	*	3.7	2.5	1.63	2.7	1.65	1.43	1.25
4	1.65	1.65	2.4	3.3	-------	3.6	2.9	1.93	3.0	1.53	1.33	1.28
5	1.50	1.70	2.4	2.8	-------	3.5	3.2	2.2	3.4	1.38	1.28	1.68
6	1.35	1.65	2.1	3.7	-------	3.3	3.7	2.3	3.4	1.38	1.23	2.2
7	1.30	1.45	2.4	3.7	-------	3.1	3.1	2.6	3.4	1.28	1.13	2.8
8	1.40	1.35	2.8	3.6	-------	2.9	3.0	2.4	3.5	1.93	0.93	2.9
9	1.35	1.50	2.8	3.3	-------	2.7	2.9	2.2	3.0	2.3	1.73	2.8
10	1.25	1.99	*	2.8	-------	2.4	2.8	2.1	3.1	2.6	1.58	2.6
11	1.20	1.75	-------	2.8	-------	2.3	2.8	1.93	3.0	4.0	1.33	2.6
12	1.15	1.70	-------	2.5	-------	2.8	2.6	1.83	2.8	3.4	1.23	2.5
13	1.50	1.65	-------	2.7	-------	3.2	2.4	1.78	2.8	3.4	1.63	2.1
14	1.45	1.55	-------	2.8	-------	3.2	2.3	1.78	2.6	2.8	1.73	1.88
15	1.30	1.85	-------	2.6	-------	2.9	2.2	1.73	2.4	2.9	1.58	1.68
16	1.55	1.85	-------	2.3	-------	2.8	2.0	1.58	2.1	3.4	1.38	1.58
17	1.75	1.70	-------	2.0	-------	2.5	1.94	1.53	1.98	5.2	1.33	1.58
18	2.2	1.50	-------	1.84	-------	2.8	1.84	1.68	1.98	4.6	1.13	1.48
19	2.4	1.45	-------	1.74	-------	2.8	1.79	1.88	1.93	4.1	1.13	1.33
20	2.1	1.60	-------	1.49	-------	2.5	1.94	1.78	1.83	4.8	1.38	1.28
21	1.85	1.75	-------	2.6	-------	2.6	1.94	1.78	1.58	4.9	1.73	1.23
22	1.80	1.90	-------	†8.9	-------	2.9	1.89	1.88	1.48	4.3	1.73	1.13
23	1.75	2.2	-------	6.4	-------	3.2	1.84	2.0	1.93	3.8	1.58	1.08
24	1.60	2.2	-------	5.9	-------	3.7	1.69	1.83	1.98	3.9	1.43	0.98
25	1.60	2.0	-------	5.4	-------	3.7	2.1	1.63	2.0	3.5	1.33	0.83
26	1.40	2.2	-------	5.0	-------	3.5	2.1	1.48	2.3	2.4	1.28	0.78
27	1.30	2.4	-------	3.8	5.0	3.3	1.84	1.43	2.4	2.3	1.33	‡0.73
28	1.20	2.4	3.8	3.5	4.7	3.1	1.79	1.83	1.98	1.98	1.58	0.93
29	1.10	2.8	3.4	3.3	-------	2.9	1.74	2.2	1.83	1.88	1.73	1.28
30	0.85	3.5	3.0	3.6	-------	2.7	1.84	2.6	1.73	1.68	1.68	1.13
31	‖1.10	-------	2.6	3.5	-------	2.4	-------	2.4	-------	1.58	1.43	-------

NOTES—*Creek frozen December 10 to 27, 1916, and February 3 to 26, 1917, inclusive. †Maximum 9.8 feet at 2 p. m. estimated from hydrograph. ‡Minimum 0.68 feet on September 27-28, 1917. ‖Interpolated.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.88	2.9	1.54	2.9	1.50	2.8	1.32	1.92	4.0	1.73	1.24	3.1
2	1.93	2.6	1.49	2.8	1.50	2.7	1.32	1.82	3.9	1.63	1.14	2.3
3	2.1	2.4	1.49	2.5	1.95	2.4	1.22	1.77	3.8	1.48	1.19	1.99
4	2.2	2.4	1.59	2.1	2.2	2.6	1.37	1.67	3.6	1.43	1.24	1.79
5	2.0	2.1	1.69	1.99	2.8	3.0	1.52	1.62	3.4	1.38	1.39	1.74
6	1.83	1.98	1.69	1.99	3.2	3.0	1.37	1.57	3.2	1.33	1.99	1.64
7	1.73	1.83	1.54	2.1	3.6	3.1	1.32	1.67	3.3	1.33	2.3	1.64
8	1.93	1.78	1.49	2.1	4.6	2.8	1.52	1.82	3.0	1.33	1.99	1.49
9	1.93	1.73	*1.79	1.99	5.4	3.2	1.72	1.72	2.9	1.28	1.99	1.39
10	1.83	1.63	1.99	1.99	8.3	3.0	2.1	1.62	3.0	1.18	2.0	1.34
11	1.63	1.58	1.94	1.99	8.0	3.0	2.0	1.57	3.1	1.13	1.94	1.29
12	1.73	1.58	1.69	1.89	7.4	3.0	1.87	1.82	3.1	1.23	1.79	1.24
13	1.43	1.48	1.59	1.89	6.2	3.3	1.52	1.77	3.0	1.38	1.89	2.5
14	2.0	1.58	1.44	1.84	5.9	3.4	1.47	1.72	2.8	1.33	2.3	2.8
15	2.6	1.58	1.39	2.1	5.3	3.4	1.42	1.67	2.8	1.28	2.1	2.3
16	2.4	1.68	1.39	1.99	4.5	3.4	1.52	1.52	2.0	1.23	1.99	2.1
17	2.2	1.68	1.34	2.1	3.5	3.0	2.1	1.42	1.98	1.18	1.69	3.5
18	1.93	1.63	1.49	1.94	3.0	2.9	2.2	1.37	1.88	‡1.08	1.64	3.6
19	2.3	1.58	1.59	1.84	3.8	2.6	1.77	1.87	1.73	‡1.03	1.54	2.9
20	4.8	1.48	1.74	1.79	†7.5	2.4	1.37	2.1	1.63	‡1.18	1.39	3.1
21	4.1	1.48	1.89	1.89	5.8	2.4	1.57	2.7	1.68	1.23	1.34	2.9
22	3.9	1.43	2.0	1.79	4.1	2.3	1.57	2.9	1.68	1.18	1.34	2.6
23	4.2	1.58	2.3	1.79	2.8	2.1	2.3	3.2	1.53	1.28	1.24	2.4
24	4.6	1.63	2.9	1.74	2.8	2.0	2.8	3.0	1.53	1.53	1.14	2.2
25	5.4	1.58	3.8	1.69	4.0	1.95	2.7	2.8	1.53	1.53	1.14	2.1
26	4.8	1.63	3.6	1.59	3.9	1.85	2.2	2.9	1.43	1.43	1.34	2.0
27	4.4	1.83	3.1	1.59	3.4	1.70	2.0	3.0	1.43	1.33	1.64	2.0
28	4.0	1.78	2.8	1.59	3.1	1.60	1.97	3.4	1.38	1.33	1.79	1.89
29	3.9	1.68	*2.2	-------	-------	1.60	2.2	3.9	1.33	1.33	1.94	1.69
30	3.5	1.63	1.94	-------	-------	1.50	1.97	4.0	1.58	1.23	2.0	1.64
31	3.0	-------	1.79	-------	-------	1.35	-------	4.2	-------	1.23	2.3	-------

NOTES—*Gage heights affected by ice December 9 to 24, 1917; December 29, 1917, to February 12, 1918, and discharge estimated from one discharge measurement under ice cover together with climatological data. †Maximum 8.0 feet from hydrograph at 4:00 a. m. ‡Minimum 1.03 feet.

Daily Discharge, in second-feet, of Crooked Creek at Hileman's Farm, Armstrong County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	145	31	555	318	1,520	1,320	205	93	240	74	58	29
2	108	42	359	240	1,960	1,220	174	74	359	74	52	24
3	97	48	318	145	*1,960	1,120	318	66	403	66	40	20
4	69	69	278	770	1,740	1,030	500	128	555	52	29	24
5	48	77	278	451	1,420	940	690	205	850	34	24	74
6	31	69	174	1,120	1,320	770	1,120	240	850	34	20	205
7	26	42	278	1,120	1,220	620	620	359	850	24	13	451
8	36	31	451	1,030	1,120	500	555	278	940	128	6	500
9	31	48	451	770	940	403	500	205	555	240	83	451
10	22	120	*451	451	850	278	451	174	620	359	58	359
11	18	87	403	451	690	240	451	128	555	1,420	29	359
12	14	77	359	318	555	451	359	104	451	850	20	318
13	48	69	278	403	451	690	278	93	451	850	66	174
14	42	54	61	451	359	690	240	93	359	451	83	115
15	26	108	48	359	278	500	205	83	278	500	58	74
16	54	108	36	240	205	451	145	58	174	850	34	58
17	87	77	26	145	145	318	130	52	140	2,750	29	58
18	205	48	18	106	145	451	106	74	140	2,070	13	46
19	278	42	11	85	145	451	95	115	128	1,520	13	29
20	174	61	11	47	145	318	130	93	104	2,300	34	24
21	108	87	18	259	174	359	130	93	58	2,420	83	20
22	97	120	77	†8,700	205	500	118	115	46	1,740	83	10
23	87	205	318	4,200	240	690	106	145	128	1,220	58	10
24	61	205	318	3,560	318	1,120	75	104	140	1,320	40	7
25	61	145	403	2,980	555	1,120	174	66	145	940	29	4
26	36	205	555	2,530	1,420	940	174	46	240	278	24	3
27	26	278	940	1,220	2,530	770	108	40	278	240	29	‡2
28	18	278	1,220	940	2,180	620	95	104	140	140	58	6
29	11	451	850	770	-------	500	85	205	104	115	88	24
30	4	690	555	1,030	-------	403	106	359	83	74	74	40
31	11	-------	359	940	-------	278	-------	278	-------	58	40	-------

NOTES—*Creek frozen December 10 to 27, 1916, and February 3 to 26, 1917, inclusive, and discharge estimated from climatological data. †Maximum=10,500 second-feet. ‡Minimum=2 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	115	575	53	87	26	515	28	126	1,460	83	21	710
2	129	405	47	77	26	460	28	101	1,370	66	14	258
3	183	303	47	77	42	303	20	90	1,280	46	17	147
4	218	303	60	77	87	405	33	72	1,100	40	21	94
5	150	183	75	61	166	640	51	64	940	34	35	85
6	103	144	75	61	303	640	33	57	780	29	147	67
7	92	103	53	87	515	710	28	72	860	29	258	67
8	129	95	47	87	860	515	51	101	640	29	147	47
9	129	83	*86	77	1,460	780	81	81	575	24	147	35
10	103	66	31	61	2,270	640	183	64	640	17	150	30
11	66	58	26	54	3,200	640	150	57	710	13	132	25
12	83	58	26	48	3,940	640	113	101	710	20	94	21
13	40	46	26	42	3,940	866	51	90	640	34	118	353
14	150	58	26	42	3,560	940	44	81	515	29	258	515
15	405	58	26	77	2,840	940	38	72	515	24	183	258
16	303	74	26	69	1,940	940	51	51	150	20	147	183
17	218	74	26	77	1,020	640	183	38	144	17	75	1,020
18	129	66	26	61	640	575	218	33	115	‡10	67	1,100
19	258	58	31	54	1,280	405	90	113	83	‡8	53	575
20	2,270	46	36	48	†5,820	303	33	183	66	‡17	35	710
21	1,550	46	42	48	3,440	303	57	460	74	20	30	575
22	1,870	40	61	42	1,550	258	57	575	74	17	30	405
23	1,640	58	108	42	515	183	258	780	59	24	21	303
24	2,050	66	353	42	515	150	515	640	52	52	14	218
25	2,960	58	1,230	36	1,460	135	460	515	52	52	14	183
26	2,270	66	1,100	26	1,370	108	218	575	40	40	30	150
27	1,830	103	710	26	940	77	150	640	40	29	67	150
28	1,460	92	515	26	710	61	141	940	34	29	94	118
29	1,370	74	*218	26	-------	61	218	1,370	29	29	132	75
30	1,020	66	120	26	-------	48	141	1,460	58	20	150	67
31	640	-------	87	26	-------	31	-------	1,640	-------	20	258	-------

NOTES—*Gage heights affected by ice December 9 to 24, 1917; December 29, 1917, to February 12, 1918, and discharge estimated from one discharge measurement under ice cover together with climatological data. †Maximum 6,580 second-feet from hydrograph at 4:00 a. m. ‡Minimum 8 second-feet.

Estimated Monthly Discharge of Crooked Creek at Hileman's Farm, Armstrong County
(Drainage area, 279 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	278	4	67	0.24	0.28
November	690	31	132	0.47	0.52
December	1,220	----------	337	1.21	1.40
January	†8,700	47	1,170	4.19	4.83
February	2,530	----------	885	3.17	3.30
March	1,320	240	647	2.32	2.68
April	1,120	75	281	1.01	1.13
May	359	40	138	0.49	0.56
June	940	46	345	1.24	1.38
July	2,420	24	748	2.68	3.09
August	83	6	44	0.16	0.18
September	500	‡2	117	0.42	0.47
The year	8,700	2	408	1.46	19.82

NOTES—Creek frozen December 10 to 27, 1916, and February 3 to 26, 1917, inclusive, and discharge estimated from climatological data. †Maximum=10,500 second-feet, January 22, 1917. ‡Minimum=2 second-feet, September 27 and 28, 1917.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	2,960	40	756	2.71	3.12
November	575	40	118	0.42	0.47
December	1,280	----------	174	0.62	0.71
January	----------	----------	55	0.20	0.23
February	5,820	----------	1,590	5.70	5.94
March	940	31	449	1.61	1.86
April	515	20	124	0.44	0.49
May	1,640	33	363	1.30	1.50
June	1,460	29	460	1.65	1.84
July	83	8	30	0.11	0.13
August	258	14	95	0.34	0.39
September	1,100	21	285	1.02	1.14
The year	5,820	8	366	1.31	17.82

NOTES—Gage heights affected by ice December 9 to 24, 1917; December 29, 1917 to February 12, 1918, and discharge estimated from one discharge measurement under ice cover to-gether with climatological data. Maximum 6,580 second-feet February 20. Minimum 8 second-feet July 18, 19 and 20.

OHIO BASIN—STATION NO. 16

STONY CREEK AT JOHNSTOWN

DESCRIPTION OF STATION

Location—At single span, steel, through truss, highway bridge at Poplar Street, Johnstown.

Records Available—Discharge complete from January 1, 1914, to September 30, 1918.

Drainage Area—468 square miles.

Gage—A vertical chain gage, whose elevation of zero is 1,154.0 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by Herbert Reitz.

Channel—Both banks are high and not subject to overflow, and the bed is stony.

Remarks—Discharge at this station does not include amount diverted from Quemahoning Reservoir.

Discharge Measurements of Stony Creek at Johnstown, Cambria County
(Drainage area, 468 square miles)

No.	Date	Hydrographer	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
35	Mar. 26	Knight	678	4.19	1,759	0.2 & 0.8 method
36	Mar. 27	Knight	595	3.82	1,481	0.2, 0.6 & 0.8 method
37	April 16	Knight	415	2.91	758	0.2 & 0.8 method
38	April 18	Knight	318	2.43	545	0.2 & 0.8 method
	1918					
39	July 9	Landis	84	1.15	86	Wading measurement at bridge

Daily Mean Gage Heights, in feet, of Stony Creek at Johnstown, Cambria County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.68	1.52	1.82	2.7	5.8	3.8	2.9	1.94	3.2	††1.80	1.40	1.22
2	1.48	1.45	1.60	2.7	5.2	3.6	2.8	1.82	2.8	1.61	1.34	1.38
3	1.42	1.40	1.58	3.8	3.9	3.4	2.8	1.72	2.5	1.51	1.38	1.36
4	1.38	1.42	1.60	4.3	3.4	3.3	2.7	1.78	2.6	††1.40	1.26	1.32
5	1.34	1.72	1.55	5.8	2.5	3.2	2.7	2.4	2.3	1.38	‖1.23	1.32
6	1.28	1.62	1.58	5.8	2.5	3.0	3.9	2.2	2.8	1.38	1.20	1.58
7	1.20	1.55	1.48	4.4	2.6	2.6	3.4	2.0	9.5	1.33	1.20	1.48
8	1.18	1.54	1.42	3.7	2.4	2.6	3.4	2.0	7.3	††1.40	1.50	2.0
9	1.18	1.42	1.55	3.5	2.4	3.6	3.9	2.2	††5.8	1.88	1.68	2.0
10	1.20	1.55	1.52	3.3	2.0	3.2	3.5	2.3	††5.0	1.92	1.52	1.75
11	1.15	1.45	1.48	3.0	1.80	7.1	3.5	2.1	4.2	2.5	1.35	1.58
12	‡1.10	1.40	1.52	2.3	1.80	††11.8	4.2	2.0	3.7	2.1	1.22	1.45
13	1.18	1.42	1.48	2.3	1.80	6.6	3.8	2.0	3.0	1.72	1.28	1.38
14	1.20	1.38	1.45	2.7	1.80	5.3	3.4	2.0	2.7	1.66	2.3	1.32
15	1.18	1.38	1.48	2.5	1.70	5.1	3.1	1.88	2.5	††1.75	2.3	1.48
16	1.18	1.32	*	2.3	1.70	4.5	2.9	1.72	2.4	3.1	1.70	1.38
17	1.20	1.38	-------	2.1	1.80	4.8	2.6	1.65	††2.3	2.6	1.90	1.36
18	1.35	1.32	-------	2.2	2.8	4.9	2.4	1.64	2.0	2.2	1.62	1.30
19	2.4	1.28	-------	2.0	2.5	4.0	2.5	1.58	1.88	2.0	1.35	1.28
20	2.6	1.35	-------	1.80	2.4	3.8	2.4	1.48	1.76	1.82	1.35	1.22
21	3.3	1.30	-------	2.7	2.3	4.4	2.2	1.45	1.70	1.64	1.28	1.22
22	2.5	1.40	-------	10.6	2.3	4.2	2.1	1.48	1.60	††2.1	1.22	1.20
23	2.0	1.32	-------	5.3	2.4	4.0	2.0	1.42	1.56	2.3	1.55	1.18
24	1.80	2.0	-------	4.1	5.1	5.6	2.2	1.70	††2.5	1.90	2.0	1.15
25	1.72	1.90	-------	3.6	4.1	5.0	2.3	1.52	2.1	1.60	1.85	‡1.12
26	1.55	1.60	-------	3.1	3.4	4.2	2.4	1.45	1.68	1.56	1.59	1.14
27	1.58	1.50	4.1	2.7	5.0	3.8	2.2	1.48	2.5	2.5	1.35	‡1.10
28	1.55	1.48	6.6	2.5	4.4	3.7	2.1	1.70	1.93	1.88	1.28	1.20
29	1.50	1.62	4.4	2.4	-------	3.6	2.0	4.0	2.0	††1.70	1.18	‡1.12
30	1.42	2.1	3.6	4.5	-------	3.4	2.0	3.1	1.89	1.48	1.30	1.12
31	1.42	-------	3.0	4.4	-------	3.2	-------	2.7	-------	1.43	1.28	-------

NOTES—*Creek frozen December 16 to 26, 1916, inclusive. †Maximum 14.0 feet at 3:00 a. m. ‡Minimum 1.10 feet October 12 and 13, 1916, and September 25, 27, 29 and 30, 1917. ††Estimated. ‖Interpolated.

Daily Mean Gage Heights, in feet, of Stony Creek at Johnstown, Cambria County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.18	2.9	1.56	2.7	1.78	8.1	1.74	2.4	3.0	1.39	1.30	2.0
2	1.18	2.7	1.59	2.6	1.82	5.5	1.66	2.3	2.7	1.39	1.15	1.65
3	1.19	2.4	1.49	2.6	1.85	4.8	1.66	2.2	2.3	1.31	1.08	1.45
4	1.36	2.3	1.44	2.5	1.85	4.6	1.86	2.1	2.0	1.27	1.00	1.35
5	1.30	2.1	1.44	2.5	1.80	5.1	1.74	1.96	1.94	1.24	‡0.95	1.32
6	1.23	2.1	1.38	2.7	1.80	5.2	1.66	1.86	1.87	1.19	‡0.95	1.20
7	1.19	1.91	1.39	2.7	1.80	4.9	1.66	1.84	2.0	1.19	‡0.95	1.20
8	1.18	1.84	*1.42	2.7	1.90	3.9	1.81	2.5	1.80	1.19	1.10	1.18
9	1.18	1.78	1.59	2.7	2.1	3.8	1.74	1.99	1.67	1.16	1.30	1.08
10	1.18	1.76	1.54	2.7	3.1	6.2	1.78	1.86	1.60	1.20	1.30	1.02
11	1.16	1.76	1.54	2.6	3.3	4.7	3.0	1.84	2.1	1.20	1.20	1.02
12	1.23	1.66	1.66	2.5	4.1	4.7	1.68	1.79	1.80	1.20	1.35	1.20
13	1.20	1.64	1.79	2.4	8.4	4.9	3.1	1.92	1.70	1.20	1.32	1.28
14	1.18	1.58	1.79	2.3	5.8	5.9	4.8	2.3	1.62	1.20	1.15	1.25
15	1.20	1.51	1.76	2.2	7.0	4.8	7.0	1.92	1.60	1.18	1.52	1.22
16	1.16	1.54	1.72	2.1	5.4	4.1	6.7	1.72	1.57	1.15	1.22	1.20
17	1.18	1.51	1.84	2.0	4.5	3.7	8.5	1.64	1.57	1.10	1.18	1.45
18	1.13	1.48	1.74	1.97	3.8	3.6	7.5	1.62	1.52	1.15	1.12	1.25
19	1.83	1.56	1.74	1.87	5.4	3.7	5.4	1.64	1.40	1.08	1.10	1.25
20	1.86	1.54	1.74	1.87	10.4	3.9	4.5	2.2	1.34	1.05	1.08	2.2
21	1.58	1.51	1.82	1.07	6.5	2.6	5.4	3.2	1.32	1.00	1.10	1.45
22	1.43	1.61	1.92	1.07	5.1	2.5	4.9	3.1	2.3	‡0.98	1.02	1.22
23	1.33	1.51	1.92	1.04	4.6	2.2	4.6	3.3	2.3	‡0.98	1.00	1.22
24	3.6	1.54	1.99	1.02	4.4	2.2	4.4	2.8	2.0	1.18	1.02	1.20
25	3.3	1.46	2.6	1.04	5.5	2.1	4.1	2.6	1.52	1.18	1.08	1.18
26	3.3	1.48	3.4	1.10	†10.7	2.1	3.8	2.6	1.37	1.08	1.00	1.15
27	4.1	1.44	3.4	1.12	6.9	1.96	3.7	2.6	1.32	1.05	1.00	1.12
28	5.9	1.48	3.2	1.07	5.6	1.93	3.1	3.0	1.17	1.00	1.00	1.10
29	4.5	1.44	3.0	1.07	-------	1.88	2.5	3.4	1.42	‡0.95	1.00	1.10
30	3.8	1.56	2.8	1.07	-------	1.78	2.4	2.9	1.42	1.00	1.18	1.08
31	3.4	-------	2.7	1.07	-------	1.78	-------	3.4	-------	1.40	1.98	-------

NOTES—*Gage heights affected by ice December 8, 1917 to February 13, 1918. †Maximum 12.7 feet from hydrograph at 3 a. m. ‡Minimum 0.95 foot

Daily Discharge, in second-feet, of Stony Creek at Johnstown, Cambria County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	252	192	309	725	3,330	1,470	840	363	1,030	300	150	100
2	178	168	220	725	2,730	1,310	780	309	780	224	141	144
3	157	150	213	1,470	1,550	1,160	780	268	625	188	144	138
4	144	157	220	1,890	1,160	1,100	725	292	675	150	110	126
5	132	268	202	3,330	625	1,030	725	575	525	144	102	126
6	115	228	213	3,330	625	900	1,550	480	780	144	95	213
7	95	202	178	1,980	675	675	1,160	390	8,510	129	95	178
8	90	199	157	1,390	575	675	1,160	390	5,000	150	185	390
9	96	157	202	1,240	575	1,310	1,550	480	3,330	336	252	390
10	95	202	192	1,100	390	1,030	1,240	525	2,530	354	192	280
11	88	168	178	900	300	4,800	1,240	435	1,800	625	135	213
12	‡70	150	192	525	300	12,600	1,800	390	1,390	435	100	168
13	99	157	178	525	300	4,190	1,470	390	900	268	115	144
14	95	144	168	725	300	2,830	1,160	390	725	244	525	126
15	90	144	178	625	260	2,620	965	336	625	280	525	178
16	90	126	*170	525	260	2,070	840	268	575	965	260	144
17	95	144	160	435	300	2,340	675	240	525	675	345	120
18	135	126	155	480	780	2,430	575	236	390	480	228	120
19	575	115	150	390	625	1,630	625	213	336	390	135	115
20	675	135	145	300	575	1,470	575	178	284	309	135	100
21	1,100	120	135	725	525	1,980	480	168	260	236	115	100
22	625	150	180	†10,400	525	1,800	435	178	220	435	100	95
23	390	126	200	2,830	575	1,630	390	157	206	525	202	90
24	300	290	180	1,710	2,630	3,130	480	260	625	345	390	82
25	268	345	200	1,310	1,710	2,530	525	192	435	220	322	175
26	202	220	255	965	1,160	1,800	575	168	252	206	216	80
27	213	185	1,710	725	2,530	1,470	480	178	625	625	135	†70
28	202	178	4,190	625	1,980	1,390	435	260	35[illegible]	336	115	95
29	185	228	1,980	575	-------	1,310	390	1,630	390	260	90	175
30	157	435	1,310	2,070	-------	1,160	390	965	340	178	120	75
31	157	-------	900	1,980	-------	1,030	-------	725	-------	160	115	-------

NOTES—*Creek frozen December 16 to 26, 1916, inclusive, and discharge estimated from climatological data. †Maximum=17,200 second-feet. ‡Minimum=70 second-feet. Discharges above 9,360 second-feet are estimated.

Daily Discharge, in second-feet, of Stony Creek at Johnstown, Cambria County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	90	840	206	150	50	6,220	276	575	900	147	120	390
2	90	725	216	150	60	2,960	244	525	725	147	82	240
3	92	575	182	150	70	2,280	244	480	525	123	66	168
4	138	525	164	150	70	2,100	327	435	390	112	50	135
5	120	435	164	135	60	2,560	276	372	363	105	‡42	126
6	102	435	144	150	50	2,660	244	327	332	92	‡42	95
7	92	350	147	150	50	2,370	244	318	390	92	‡42	95
8	90	318	*135	150	70	1,530	304	625	300	92	70	90
9	90	292	120	135	95	1,450	276	386	248	85	120	66
10	90	284	120	120	120	3,710	292	327	220	95	120	54
11	85	260	107	120	202	2,190	900	318	435	95	95	54
12	102	244	107	120	390	2,190	252	296	200	95	135	95
13	95	230	95	107	1,610	2,370	960	354	260	95	126	115
14	90	213	95	95	3,270	3,380	2,280	525	228	95	82	108
15	95	188	82	95	4,720	2,280	4,720	354	220	90	192	100
16	85	199	70	95	2,860	1,690	4,330	268	210	82	100	95
17	90	188	70	82	2,010	1,380	6,860	236	210	70	90	168
18	78	178	70	82	1,450	1,310	5,370	228	192	82	75	108
19	314	206	70	70	2,860	1,380	2,860	236	150	66	70	108
20	327	199	70	70	10,200	1,530	2,010	480	132	60	66	480
21	213	188	70	60	4,070	675	2,860	1,030	126	50	70	168
22	160	224	70	60	2,560	625	2,370	960	525	‡47	54	100
23	129	188	70	50	2,100	480	2,100	1,100	525	‡47	50	100
24	1,310	199	95	50	1,930	480	1,930	780	390	90	54	95
25	1,100	171	120	50	2,960	435	1,690	675	192	90	66	90
26	1,100	178	185	50	†10,700	435	1,450	675	141	66	50	82
27	1,690	164	260	50	4,590	372	1,380	675	126	60	50	75
28	3,380	178	240	50	3,060	358	960	900	88	50	50	70
29	2,010	164	220	50	-------	336	625	1,170	157	‡42	50	70
30	1,450	206	185	50	-------	292	575	840	157	50	96	66
31	1,170	-------	150	50	-------	292	-------	1,170	-------	150	381	-------

NOTES—*Gage heights affected by ice December 8, 1917, to February 13, 1918, and discharge estimated from climatological data. †Maximum 14,500 second-feet from hydrograph at 3 a. m. ‡Minimum 42 second-feet.

Estimated Monthly Discharge of Stony Creek at Johnstown, Cambria County
(Drainage area, 468 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	1,100	‡70	230	0.49	0.56
November	435	115	190	0.41	0.46
December	4,190	----------	485	1.04	1.20
January	10,400	300	1,500	3.23	3.72
February	3,330	260	995	2.14	2.23
March	†12,600	675	2,160	4.65	5.36
April	1,800	390	834	1.79	2.00
May	1,630	157	388	0.83	0.96
June	8,510	206	1,170	2.52	2.81
July	965	129	333	0.72	0.83
August	525	90	190	0.41	0.47
September	390	‡70	145	0.31	0.35
The year	12,600	70	718	1.54	20.95

NOTES—Creek frozen December 16 to 26, 1916, inclusive, and discharge estimated from climatological data. †Maximum=17,200 second-feet, March 12, 1917. ‡Minimum=70 second-feet, October 12 and 13, 1916, and September 25, 27, 29 and 30, 1917. Discharges above 9,360 second-feet are estimated.

Estimated Monthly Discharge of Stony Creek at Johnstown, Cambria County
(Drainage area, 468 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	3,380	78	518	1.11	1.28
November	840	164	292	0.62	0.69
December	----------	----------	132	0.28	0.32
January	----------	----------	95	0.20	0.23
February	10,700	----------	2,220	4.74	4.94
March	6,220	292	1,690	3.61	4.16
April	6,860	244	1,640	3.50	3.90
May	1,170	228	569	1.22	1.41
June	900	88	305	0.65	0.73
July	150	42	86	0.18	0.21
August	381	42	89	0.19	0.22
September	480	54	127	0.27	0.30
The year	10,700	42	635	1.36	18.39

NOTES—Gage heights affected by ice December 8, 1917 to February 13, 1918, and discharge estimated from climatological data. Maximum 14,500 second-feet February 26. Minimum 42 second-feet July 22, 23 and 29, and August 5 to 7.

OHIO BASIN—STATION NO. 17

BLACKLICK CREEK AT BLACKLICK

DESCRIPTION OF STATION

Location—At three span, steel, through truss, highway bridge, ¼ mile from railroad station at Blacklick, Indiana County.

Records Available—Discharge complete from August 16, 1904, to December 31, 1905, and from January 8, 1907, to September 30, 1918.

Drainage Area—386 square miles.

Gage—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge and is read twice daily by Miss Carrie Kelly.

Channel—The right bank is not subject to overflow, while the left bank overflows at gage height 12 feet and the bed is composed of gravel, sand and boulders.

Discharge Measurements of Blacklick Creek at Blacklick, Indiana County
(Drainage area, 386 square miles)

No.	Date	Hydrographer	Area	G. H	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
33	May 7	Wilson	537	3.34	515	Multiple point method.
34	June 25	Wilson	495	3.00	537	0.2 & 0.8 method.
	1918					
35	July 19	Landis	62	2.21	42	0.6 method.

Daily Mean Gage Heights, in feet, of Blacklick Creek at Blacklick, Indiana County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	2.49	2.69	3.5	3.7	5.6	3.8	3.6	2.74	4.3	3.0	2.40	2.68
2	2.39	2.69	3.4	3.7	4.4	3.6	3.6	2.82	3.8	3.2	2.50	2.60
3	2.29	2.59	3.2	4.3	3.5	3.5	3.5	2.69	3.7	3.0	2.85	2.55
4	2.29	2.51	3.1	4.8	3.9	3.5	3.3	2.60	3.4	2.85	2.65	2.45
5	2.24	2.54	3.1	5.6	3.5	3.2	3.4	3.3	3.3	2.70	2.40	2.40
6	2.27	2.61	2.98	6.3	*	3.1	4.5	3.5	5.2	2.60	2.45	2.55
7	2.24	2.59	2.80	5.0	-------	3.3	4.2	3.3	7.6	2.60	2.40	3.4
8	‡2.19	2.54	2.76	4.4	-------	4.2	4.5	3.4	5.5	2.70	2.42	6.4
9	2.24	2.44	2.83	4.1	-------	4.1	4.2	3.5	4.7	3.0	3.5	4.8
10	2.21	2.64	2.83	4.0	-------	3.8	3.9	3.5	4.4	3.6	2.85	3.8
11	2.34	2.79	2.68	3.7	-------	5.1	3.8	3.3	4.3	4.1	2.65	3.4
12	2.19	2.69	2.93	3.1	-------	6.9	3.6	3.2	3.8	3.4	2.45	3.2
13	2.27	2.64	2.68	3.3	-------	5.1	3.6	3.1	3.5	3.0	2.45	3.0
14	‡2.24	2.77	2.58	3.4	-------	5.2	3.4	3.1	3.3	2.95	7.3	2.85
15	2.34	2.84	2.68	3.4	-------	4.9	3.2	2.94	3.2	2.78	4.8	2.70
16	2.34	2.74	2.58	3.3	-------	4.4	3.2	2.84	3.1	3.0	3.9	2.70
17	2.29	2.77	2.63	2.97	-------	4.3	3.1	2.84	2.99	3.7	3.4	2.55
18	2.29	2.64	2.68	3.1	-------	4.3	2.95	2.74	2.84	3.4	3.1	2.55
19	2.64	2.59	2.66	3.3	-------	3.9	3.2	2.72	2.74	3.2	2.90	2.45
20	3.4	2.64	2.66	3.5	-------	3.8	3.3	2.69	2.69	3.0	2.75	2.50
21	3.5	2.59	2.68	3.1	3.8	3.9	3.1	2.64	2.64	2.85	2.65	2.48
22	3.1	2.57	3.5	†9.7	3.4	3.8	2.95	2.64	2.62	3.2	2.60	2.42
23	2.87	2.59	3.7	6.2	3.2	3.8	2.87	2.99	2.54	3.4	2.70	2.35
24	2.77	3.4	3.4	4.9	4.9	5.8	2.85	2.84	2.99	2.95	3.9	2.30
25	2.59	3.5	3.3	4.5	4.3	4.9	2.80	2.74	2.90	2.75	3.0	2.30
26	2.54	3.1	3.1	3.8	4.1	4.3	2.95	2.72	2.70	2.70	2.70	2.25
27	2.51	3.1	4.5	3.4	4.6	4.2	2.95	2.66	3.6	2.85	2.62	2.20
28	2.49	3.0	6.2	3.6	4.2	4.4	2.85	2.92	3.1	2.65	2.52	2.25
29	2.44	4.5	5.3	3.5	-------	4.1	2.75	4.5	3.8	2.55	2.75	2.20
30	2.34	3.8	4.5	4.5	-------	4.0	2.70	4.2	3.4	2.45	3.0	2.30
31	2.44	-------	3.9	4.5	-------	3.7	-------	3.8	-------	2.45	2.90	-------

NOTES—*Creek frozen February 6 to 20, 1917, inclusive. †Maximum 11.3 feet at noon estimated from hydrograph. ‡Minimum 2.19 feet October 8 to 12 and 14, 1916.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.32	4.0	2.85	3.5	2.56	4.9	2.62	2.97	3.8	2.61	2.33	5.0
2	2.30	3.8	2.95	3.8	2.73	4.8	2.57	2.84	3.5	2.43	2.23	3.7
3	2.28	3.6	2.75	3.8	2.91	4.4	2.64	2.72	3.2	2.33	‡2.15	3.2
4	2.60	3.4	2.85	3.7	2.89	4.1	2.67	2.72	3.0	2.28	‡2.18	3.1
5	2.70	3.3	2.80	3.7	2.99	4.5	2.57	2.74	2.95	2.33	‡2.48	2.88
6	2.50	3.2	2.70	3.6	3.0	4.5	2.54	2.67	2.91	2.33	2.63	2.83
7	2.40	3.1	2.75	3.1	3.2	4.7	2.52	2.57	3.2	2.23	2.43	2.71
8	2.40	3.0	2.65	3.1	3.7	4.3	2.70	2.62	3.2	2.23	2.65	2.58
9	2.30	2.92	*2.55	3.0	4.9	4.3	3.5	2.62	2.88	2.23	2.53	2.48
10	2.30	2.90	2.80	2.99	7.3	5.9	3.3	2.67	2.78	2.23	2.63	2.43
11	2.25	2.82	3.0	2.76	7.2	4.8	3.6	2.52	2.93	2.21	2.58	2.3
12	2.48	2.80	2.90	2.51	6.1	4.5	3.6	2.67	3.3	2.25	2.38	2.8
13	2.75	2.70	2.60	3.1	8.2	4.3	3.8	2.90	3.1	2.31	2.43	4.4
14	2.50	2.65	2.60	3.4	6.8	5.6	4.9	3.3	2.98	2.28	2.41	3.6
15	2.58	2.60	2.70	3.3	7.8	5.4	5.7	2.97	2.78	2.23	2.43	3.2
16	2.70	2.65	2.55	3.5	5.9	4.6	5.9	2.82	2.63	‡2.18	2.33	2.98
17	2.60	2.62	2.55	3.2	4.8	4.2	5.7	2.72	2.68	2.21	2.23	4.6
18	2.50	2.65	2.55	2.96	4.0	4.0	5.6	2.62	2.75	2.23	‡2.18	4.8
19	4.0	2.60	2.50	2.96	4.6	3.8	4.8	2.62	2.55	‡2.15	‡2.18	4.0
20	5.2	2.58	2.50	2.91	†9.0	3.5	4.3	2.60	2.48	‡2.13	‡2.13	4.3
21	4.0	2.58	2.68	2.99	5.8	3.4	4.1	3.5	2.43	‡2.13	‡2.18	4.0
22	3.6	2.52	3.2	2.99	4.6	3.1	4.0	3.5	2.83	‡2.13	‡2.13	3.6
23	3.4	2.70	3.2	2.99	4.2	3.1	3.7	4.8	2.88	‡2.15	‡2.13	5.4
24	4.2	2.62	3.2	2.99	4.1	2.97	3.6	3.9	2.63	‡2.13	‡2.13	3.2
25	5.5	2.50	4.0	2.83	4.4	2.94	3.4	3.8	2.51	2.38	2.23	3.0
26	5.6	2.48	3.6	2.71	7.2	2.82	3.2	4.1	2.48	2.43	‡2.13	3.1
27	6.0	2.25	3.4	2.61	5.4	2.80	3.1	3.7	2.43	2.23	‡2.13	3.1
28	6.4	2.50	3.3	3.0	4.7	2.77	3.0	3.6	2.33	2.21	2.20	2.88
29	5.4	2.55	3.0	2.93	-------	2.72	2.97	3.8	2.65	2.25	4.2	2.73
30	5.2	2.65	2.90	2.96	-------	2.67	2.92	5.2	2.81	2.25	3.3	2.63
31	4.5	-------	*2.4	2.61	-------	2.62	-------	4.2	-------	2.41	4.3	-------

NOTES—*Gage heights affected by ice December 9 to 16, 1917; December 31, 1917 to February 11, 1918. †Maximum 10.8 feet from hydrograph at 10 a. m. ‡Minimum 2.13 feet.

Daily Discharge, in second-feet, of Blacklick Creek, at Blacklick, Indiana County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	117	188	590	730	2,840	805	660	208	1,230	318	90	184
2	87	188	525	730	1,320	660	660	240	805	415	120	153
3	62	150	415	1,230	590	590	590	188	730	318	253	156
4	62	123	365	1,730	885	590	470	188	525	253	172	105
5	52	133	365	2,840	590	415	365	470	470	192	90	90
6	58	157	309	4,060	*415	365	1,420	590	2,230	153	105	136
7	52	150	253	1,960	274	470	1,140	470	6,740	153	90	525
8	‡42	133	216	1,320	232	1,140	1,420	525	2,680	192	96	4,260
9	52	105	240	1,060	215	1,060	1,140	590	1,060	318	590	1,730
10	46	169	245	965	525	805	885	590	1,320	660	253	805
11	74	228	184	730	470	2,090	805	470	1,230	1,050	172	525
12	42	188	287	365	415	5,270	660	415	805	525	105	415
13	58	169	184	470	274	2,090	660	365	590	318	105	318
14	‡52	229	146	525	153	2,230	525	365	470	296	6,110	253
15	74	249	184	525	120	1,840	415	292	415	224	1,730	192
16	74	208	146	470	90	1,320	415	249	365	318	885	192
17	62	220	165	305	90	1,230	365	249	314	730	525	136
18	62	169	184	365	192	1,230	296	208	249	525	365	136
19	169	150	176	470	525	885	415	200	208	415	274	105
20	525	169	176	590	660	805	470	188	188	318	212	120
21	590	150	184	365	805	885	365	169	169	253	172	114
22	365	143	590	†11,400	525	805	296	169	161	415	153	96
23	261	150	730	3,880	415	805	261	314	133	525	192	77
24	220	525	525	1,840	1,840	3,160	253	249	314	296	885	64
25	150	590	470	1,420	1,230	1,840	232	208	274	212	318	64
26	133	365	365	805	1,050	1,230	296	200	192	192	192	54
27	123	365	1,420	525	1,520	1,140	296	176	660	253	161	44
28	117	318	3,880	660	1,140	1,320	253	283	365	172	127	54
29	102	1,420	2,380	590	-------	1,050	212	1,420	805	136	212	44
30	74	805	1,420	1,420	-------	965	192	1,140	525	105	318	64
31	102	-------	885	1,420	-------	730	-------	805	-------	105	274	-------

NOTES—*Creek frozen February 6 to 20, 1917, inclusive, and discharge estimated from climatological data. †Maximum = 15,800 second-feet. ‡Minimum = 42 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	69	965	253	172	54	1,840	161	365	805	157	72	1,960
2	64	805	296	136	64	1,730	143	249	590	99	50	730
3	60	660	212	105	90	1,320	169	200	415	72	‡36	415
4	153	525	253	90	90	1,050	180	200	318	60	‡41	365
5	192	470	232	77	90	1,420	143	208	296	72	‡114	266
6	120	415	192	64	120	1,420	133	180	278	72	165	245
7	90	365	212	64	153	1,620	127	143	415	50	99	196
8	90	318	172	64	212	1,230	192	161	415	50	172	146
9	64	283	*120	64	318	1,230	590	161	266	50	130	114
10	64	274	90	36	660	3,340	470	180	224	50	165	99
11	54	240	77	36	1,140	1,730	660	127	287	46	146	85
12	114	232	64	44	3,690	1,420	660	180	470	54	85	253
13	212	192	64	77	8,000	1,230	805	274	365	67	99	1,520
14	120	172	77	120	5,060	2,840	1,840	470	300	60	93	660
15	146	153	90	120	7,160	2,520	3,000	305	224	50	99	415
16	192	172	120	105	3,340	1,520	3,340	240	165	‡41	72	309
17	153	161	136	90	1,730	1,140	3,000	200	184	46	50	1,520
18	120	172	136	90	965	965	2,840	161	212	50	‡41	1,730
19	965	153	120	77	1,520	805	1,730	161	136	‡36	‡41	965
20	2,230	146	120	64	†9,760	590	1,230	153	114	‡33	‡33	1,230
21	965	146	184	64	3,160	525	1,050	590	99	‡33	‡41	965
22	660	127	415	54	1,520	365	965	590	245	‡33	‡33	660
23	525	192	415	44	1,140	365	730	1,730	266	‡36	‡33	525
24	1,140	161	415	44	1,050	305	660	885	165	‡33	‡33	415
25	2,680	120	965	44	1,320	292	525	805	123	85	50	318
26	2,840	114	660	44	5,900	240	415	1,050	114	99	‡33	365
27	3,510	54	525	44	2,520	232	365	730	99	50	‡33	365
28	4,260	120	470	44	1,620	220	318	660	72	46	44	266
29	2,520	136	318	44	-------	200	305	805	172	54	1,140	204
30	2,230	172	274	44	-------	180	283	2,230	236	54	470	165
31	1,420	-------	*232	44	-------	161	-------	1,140	-------	93	1,230	-------

NOTES—*Gage heights affected by ice December 9 to 16, 1917; December 31, 1917, to February 11, 1918, and discharge estimated from climatological data. †Maximum 14,400 second-feet from hydrograph at 10 a. m. ‡Minimum 33 second-feet.

Estimated Monthly Discharge of Blacklick Creek at Blacklick, Indiana County
(Drainage area, 386 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	590	‡42	131	0.34	0.39
November,	1,420	102	276	0.72	0.80
December,	3,880	146	587	1.52	1.75
January,	†11,400	305	1,480	3.84	4.43
February,	2,840	----------	700	1.81	1.88
March,	5,270	365	1,280	3.32	3.83
April,	1,420	192	553	1.43	1.60
May,	1,420	169	393	1.02	1.18
June,	6,740	133	893	2.31	2.58
July,	1,050	105	334	0.87	1.00
August,	6,110	90	495	1.28	1.48
September,	4,260	44	373	0.97	1.08
The Year,	11,400	42	625	1.62	22.00

NOTE—Creek frozen February 6 to 20, 1917, inclusive, and discharge estimated from climatological data. †Maximum = 15,800 second-feet, January 22, 1917. ‡Minimum = 42 second-feet, October 8 to 12 and 14, 1916.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	4,260	54	904	2.34	2.70
November	965	54	274	0.71	0.79
December	965	----------	255	0.66	0.76
January	----------	----------	71	0.18	0.21
February	9,760	----------	2,230	5.78	6.02
March	3,340	161	1,100	2.85	3.28
April	3,340	127	901	2.33	2.60
May,	2,230	127	499	1.29	1.49
June,	805	72	269	0.69	0.77
July	157	33	59	0.15	0.17
August	1,230	33	159	0.41	0.47
September	1,960	85	576	1.49	1.66
The Year	9,760	33	596	1.54	20.92

NOTES—Gage heights affected by ice December 9 to 16, 1917; December 31, 1917 to February 11, 1918 and discharge estimated from climatological data. Maximum 14,400 second-feet February 20. Minimum 33 second-feet several days in July and August.

OHIO BASIN—STATION NO. 18

KISKIMINITAS RIVER AT AVONMORE

DESCRIPTION OF STATION

Location.—At four span, steel, through truss, highway bridge at P. R. R. Station, Avonmore, Westmoreland County.

Records Available.—Discharge complete from May 29, 1907, to September 30, 1918.

Drainage Area.—1,720 square miles.

Gage.—A standard chain gage, whose elevation of zero is 805.64 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by J. H. Shoup.

Channel.—The right bank is high; the left is low and liable to overflow, and the bed is composed of gravel.

Discharge Measurement of Kiskiminitas River at Avonmore, Westmoreland County
(Drainage area, 1,720 square miles)

No.	Date	Hydrographer	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
33	July 14	Wilson	1,144	4.59	1,788	0.2 & 0.8 method
34	Dec. 20	Wilson	584	3.76	597	Under ice cover
	1918					
35	July 19	Landis	343	2.60	392	0.2, 0.8 & 0.6 method

Daily Mean Gage Heights, in feet, of Kiskiminitas River at Avonmore, Westmoreland County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	3.8	2.99	4.8	5.9	9.2	7.2	5.8	4.0	6.0	4.6	3.1	3.2
2	3.2	3.3	4.4	5.9	9.6	6.4	5.6	4.0	6.4	4.4	3.0	3.0
3	2.92	3.2	4.1	6.1	*	6.0	5.6	3.8	5.7	4.2	4.4	3.0
4	2.77	3.0	3.8	9.0	-------	6.0	5.3	3.7	5.2	3.8	3.5	3.0
5	2.75	3.1	3.8	9.4	-------	5.8	4.9	4.1	4.8	3.5	3.1	2.82
6	2.67	3.2	3.8	13.0	-------	5.3	7.6	5.0	5.2	3.4	3.0	2.95
7	2.62	3.2	3.6	9.7	-------	5.3	8.3	4.8	12.5	3.3	3.2	3.6
8	2.59	3.1	3.4	8.2	-------	7.3	8.1	4.6	12.7	4.0	2.90	6.0
9	‡2.55	2.97	3.4	7.2	-------	8.1	8.0	5.0	9.8	4.4	3.6	6.7
10	2.52	3.1	3.4	6.8	-------	7.0	7.2	5.2	8.2	6.3	3.6	5.1
11	2.57	3.6	3.4	6.3	-------	8.5	6.5	5.0	8.8	7.5	3.2	4.2
12	2.57	3.4	3.3	5.1	-------	17.6	6.7	4.8	7.2	6.4	3.0	3.8
13	2.57	3.2	3.4	4.6	-------	12.4	6.7	4.5	6.1	5.2	2.85	3.4
14	2.59	3.3	*	6.1	-------	10.0	6.2	4.4	5.5	4.6	7.0	3.3
15	2.65	3.7	-------	*	-------	9.8	5.8	4.2	5.0	4.6	6.8	3.1
16	2.62	3.6	-------	-------	-------	8.5	5.4	4.0	4.8	5.2	5.2	2.98
17	2.62	3.3	-------	-------	-------	7.8	5.0	3.9	4.5	5.9	4.4	2.85
18	2.65	3.3	-------	-------	-------	8.6	4.8	3.8	4.2	5.6	4.0	2.88
19	2.99	3.2	-------	-------	-------	7.4	4.8	3.7	3.8	5.1	3.4	2.80
20	4.8	3.1	-------	-------	-------	6.9	4.9	3.6	3.8	4.6	3.2	2.80
21	5.2	3.1	-------	-------	-------	6.8	4.8	3.4	3.6	5.0	3.0	2.75
22	4.8	3.0	-------	†21.4	-------	7.2	4.4	3.4	3.5	4.3	2.98	2.70
23	4.0	3.0	7.2	13.8	-------	6.8	4.2	3.5	3.4	5.3	2.98	2.70
24	3.6	4.2	8.2	9.8	-------	10.0	4.1	3.8	4.5	4.6	4.1	2.58
25	3.4	5.0	7.4	8.2	-------	9.6	4.0	3.7	5.0	4.0	4.2	2.55
26	3.3	4.2	7.2	6.9	-------	8.2	4.4	3.5	4.0	4.0	3.4	2.55
27	3.2	3.9	7.6	6.0	7.8	7.4	4.6	3.4	5.2	4.5	3.1	2.55
28	3.1	3.9	12.8	5.9	8.2	7.6	4.3	3.4	5.3	4.4	2.98	2.60
29	3.0	4.0	10.9	5.8	-------	7.0	4.1	6.2	5.3	3.7	2.90	2.60
30	2.82	4.5	8.2	7.0	-------	6.8	4.0	7.0	5.6	3.4	3.3	2.60
31	2.87	-------	6.7	8.7	-------	6.3	-------	5.9	-------	3.2	3.4	-------

NOTES—*River frozen December 14 to 22, 1916; January 15 to 21 and February 3 to 26, 1917 inclusive. †Maximum 24.0 feet at 3 p. m. ‡Minimum 2.52 feet on October 9 and 10, 1916.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.60	6.8	3.4	5.9	6.0	9.4	3.7	4.6	6.6	3.5	2.88	8.3
2	2.60	6.1	3.6	5.8	6.0	9.9	3.6	4.4	5.8	3.4	2.75	5.6
3	2.60	5.5	3.5	5.9	5.9	8.7	3.7	4.2	5.1	3.2	2.62	4.4
4	2.75	5.1	3.4	6.0	6.0	7.9	3.7	4.1	4.6	2.98	2.55	3.9
5	2.95	4.8	3.4	6.0	6.0	8.5	3.7	4.0	4.3	2.88	2.48	3.6
6	2.85	4.5	3.3	6.0	5.8	8.7	3.6	3.8	4.1	2.80	‡2.58	3.3
7	2.72	4.3	3.2	6.0	6.2	9.0	3.3	3.8	4.2	2.80	2.70	3.2
8	2.62	4.2	3.2	6.1	7.8	8.0	3.6	3.9	4.2	2.68	2.65	2.99
9	2.60	4.0	*3.8	6.0	10.6	7.5	4.8	4.0	3.8	2.65	3.1	2.79
10	2.60	3.8	3.6	5.9	10.6	11.2	5.6	3.8	3.7	2.75	3.2	2.75
11	2.60	3.8	3.8	5.8	9.4	10.2	5.8	3.7	4.3	2.72	3.2	2.67
12	2.65	3.7	4.0	5.8	11.2	9.0	6.4	3.8	4.2	2.75	2.88	2.96
13	2.95	3.6	3.9	6.0	16.4	8.2	6.5	3.9	4.2	2.75	2.80	5.1
14	2.92	3.5	3.8	6.0	13.3	9.9	9.0	4.6	3.9	2.78	2.84	4.8
15	2.82	3.4	3.7	6.1	14.3	10.5	11.6	4.5	3.7	2.68	4.3	3.9
16	2.90	3.4	3.7	6.4	12.1	8.5	12.2	4.1	3.5	2.65	3.6	3.5
17	2.90	3.4	3.7	6.4	9.0	7.7	12.2	3.9	3.4	2.62	3.0	5.9
18	2.78	3.4	3.6	6.4	7.2	6.9	13.4	3.8	3.6	2.60	2.75	7.3
19	4.9	3.2	3.8	6.3	7.4	6.3	10.4	3.6	3.4	2.60	2.62	5.4
20	8.4	3.2	3.8	6.2	†17.4	6.1	8.6	3.5	3.2	2.58	2.58	5.1
21	5.9	3.2	3.9	6.6	13.6	5.5	7.8	5.3	3.0	2.55	2.48	5.4
22	4.8	3.2	4.4	6.0	9.6	5.1	8.6	5.5	3.3	2.52	2.45	4.7
23	4.2	3.3	4.8	6.0	8.1	4.9	7.4	6.9	4.3	2.45	2.50	4.3
24	5.5	3.3	4.9	6.1	7.8	4.6	6.4	7.1	3.8	2.45	2.52	3.9
25	9.7	3.2	5.5	6.0	8.6	4.4	5.9	6.2	3.4	2.50	2.50	3.7
26	9.6	3.0	6.8	6.1	16.4	4.3	5.4	7.1	3.2	3.3	2.45	3.6
27	10.6	3.0	6.2	6.1	13.2	4.2	5.1	6.6	3.1	2.90	2.42	3.6
28	12.6	2.95	6.2	6.0	10.0	4.0	4.8	5.5	3.0	2.65	2.59	3.4
29	10.2	3.2	6.0	5.8	-------	4.0	4.6	5.2	3.1	2.50	4.4	3.2
30	8.7	3.3	5.6	5.8	-------	3.8	4.6	9.8	3.9	2.60	4.2	2.99
31	7.9	-------	5.5	6.0	-------	3.7	-------	8.1	-------	2.82	5.3	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 12, 1918 and discharge estimated from one discharge measurement under ice cover together with climatological records. †Maximum 22.0 feet from hydrograph at 9 p. m. ‡Minimum 2.40 feet.

Daily Discharge, in second-feet, of Kiskiminitas River at Avonmore, Westmoreland County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1,160	594	2,050	3,260	7,780	4,880	3,140	1,320	3,380	1,860	665	735
2	735	805	1,680	3,260	8,460	3,860	2,920	1,320	3,860	1,680	600	600
3	552	735	1,410	3,500	*8,120	3,380	2,920	1,160	3,030	1,500	1,680	600
4	464	600	1,160	7,460	7,950	3,380	2,580	1,090	2,460	1,160	945	600
5	452	665	1,160	8,120	7,780	3,140	2,150	1,410	2,050	945	665	492
6	410	735	1,160	15,700	7,620	2,580	5,400	2,250	2,460	875	600	570
7	385	735	1,020	8,630	7,460	2,580	6,410	2,050	14,500	805	735	1,020
8	370	665	875	6,260	7,460	5,010	6,110	1,860	15,000	1,320	540	3,380
9	‡352	582	875	4,880	7,460	6,110	5,960	2,250	8,800	1,680	1,020	4,240
10	339	665	875	4,360	7,460	4,620	4,880	2,460	6,260	3,740	1,020	2,360
11	362	1,020	875	3,740	6,860	6,710	3,990	2,250	7,160	5,270	735	1,500
12	362	875	805	2,360	6,410	28,500	4,240	2,050	4,880	3,860	600	1,160
13	362	735	875	1,860	6,560	14,300	4,240	1,770	3,500	2,460	510	875
14	370	805	*875	3,500	5,510	9,170	3,620	1,680	2,800	1,860	4,620	805
15	400	1,090	820	*5,960	5,010	8,800	3,140	1,500	2,250	1,860	4,360	665
16	385	1,020	805	7,460	4,620	6,710	2,680	1,320	2,050	2,460	2,460	588
17	385	805	790	7,160	4,750	5,680	2,250	1,240	1,770	3,260	1,680	510
18	400	805	740	6,860	4,880	6,860	2,050	1,160	1,500	2,920	1,320	528
19	594	735	680	6,560	5,140	5,140	2,050	1,090	1,160	2,360	875	480
20	2,050	665	650	6,260	5,400	4,490	2,150	1,020	1,160	1,860	735	480
21	2,460	665	1,020	5,960	5,540	4,360	2,050	875	1,020	2,250	600	452
22	2,050	600	2,250	†41,700	5,960	4,880	1,680	875	945	1,590	588	425
23	1,320	600	4,880	17,700	5,960	4,360	1,500	945	875	2,580	588	425
24	1,020	1,500	6,260	8,800	7,160	9,170	1,410	1,160	1,770	1,860	1,410	366
25	875	2,250	5,140	6,260	8,980	8,460	1,320	1,090	2,250	1,320	1,500	352
26	805	1,500	4,880	4,490	7,460	6,260	1,680	945	1,320	1,320	875	352
27	735	1,240	5,400	3,380	5,680	5,140	1,860	875	2,460	1,770	665	352
28	665	1,240	15,200	3,260	6,260	5,400	1,590	875	2,580	1,680	588	375
29	600	1,320	10,900	3,140	-------	4,620	1,410	3,620	2,580	1,090	540	375
30	492	1,770	6,260	4,620	-------	4,360	1,320	4,620	2,920	875	805	375
31	522	-------	4,240	7,010	-------	3,740	-------	3,260	-------	735	875	-------

NOTES—*River frozen December 14 to 22, 1916; January 15 to 21 and February 3 to 26, 1917, inclusive, and discharge estimated from climatological data. †Maximum=51,800 second-feet. ‡Minimum=339 second-feet.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	375	4,360	875	632	510	8,120	1,090	1,860	4,120	945	528	6,410
2	375	3,500	1,020	600	510	8,980	1,020	1,680	3,140	875	452	2,920
3	375	2,800	945	570	510	7,010	1,090	1,500	2,360	735	385	1,680
4	452	2,360	875	570	510	5,820	1,090	1,410	1,860	588	352	1,240
5	570	2,050	875	570	510	6,710	1,090	1,320	1,590	528	321	1,020
6	510	1,770	805	570	510	7,010	1,020	1,160	1,410	480	‡366	805
7	436	1,590	735	600	600	7,460	805	1,160	1,500	480	425	735
8	385	1,560	*735	665	735	5,960	1,020	1,240	1,500	415	400	594
9	375	1,320	700	665	1,770	5,270	2,050	1,320	1,160	400	665	475
10	375	1,160	665	665	4,240	11,500	2,920	1,160	1,090	452	735	452
11	375	1,160	665	632	6,710	9,550	3,140	1,090	1,590	436	735	410
12	400	1,090	632	632	8,800	7,460	3,860	1,160	1,500	452	528	576
13	570	1,020	600	600	24,800	6,260	3,990	1,240	1,500	452	480	2,360
14	552	945	600	600	16,400	8,980	7,460	1,860	1,240	469	504	2,050
15	492	875	570	570	19,000	10,100	12,400	1,770	1,090	415	1,590	1,240
16	540	875	570	570	13,600	6,710	13,800	1,410	945	400	1,020	945
17	540	875	540	540	7,460	5,540	13,800	1,240	875	385	600	3,260
18	528	875	540	510	4,880	4,490	16,700	1,160	1,020	375	452	5,010
19	2,150	735	570	510	5,140	3,740	9,930	1,020	875	375	385	2,680
20	6,560	735	597	510	†27,900	3,500	6,860	945	735	366	366	2,360
21	3,260	735	665	510	17,200	2,800	5,680	2,580	600	352	321	2,680
22	2,050	735	840	510	8,460	2,360	5,960	2,800	805	339	308	1,960
23	1,500	805	1,090	510	6,110	2,150	5,140	4,490	1,590	308	330	1,590
24	2,800	805	1,370	510	5,680	1,860	3,860	4,750	1,160	308	339	1,240
25	8,630	735	1,720	510	6,860	1,680	3,260	2,620	875	330	330	1,090
26	8,460	600	2,360	510	24,800	1,500	2,680	4,750	735	805	308	1,020
27	10,300	600	1,900	510	16,200	1,500	2,360	4,120	665	540	294	1,020
28	14,700	570	1,590	510	9,170	1,320	2,050	2,800	600	400	370	875
29	9,550	735	1,160	510	-------	1,320	1,860	2,460	665	330	1,680	735
30	7,010	805	875	510	-------	1,160	1,860	8,800	1,240	375	1,500	594
31	5,820	-------	700	510	-------	1,090	-------	6,110	-------	492	2,580	-------

NOTES—*Gage heights affected by ice December 9, 1917, to February 12, 1918, and discharge estimated from one discharge measurement under ice cover together with climatological records. †Maximum 43,900 second-feet from hydrograph at 9 p. m. ‡Minimum 285 second-feet.

Estimated Monthly Discharge of Kiskiminitas River at Avonmore, Westmoreland County
(Drainage area, 1,720 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	2,460	‡339	724	0.42	0.48
November	2,250	582	934	0.54	0.60
December	15,200	----------	2,790	1.62	1.87
January	†41,700	1,860	7,210	4.19	4.83
February	----------	----------	6,630	3.85	4.01
March	28,500	2,580	3,120	1.81	2.09
April	6,410	1,320	2,960	1.72	1.92
May	4,620	875	1,660	0.97	1.12
June	15,000	875	3,620	2.10	2.34
July	5,270	735	1,960	1.14	1.31
August	4,360	510	1,140	0.66	0.76
September	4,240	352	868	0.50	0.56
The year	41,700	339	2,780	1.62	21.89

NOTES—River frozen December 14 to 22, 1916; January 15 to 21 and February 3 to 26, 1917, inclusive, and discharge estimated from climatological data. †Maximum=51,800 second-feet, January 22, 1917. ‡Minimum=339 second-feet, October 9 and 10, 1916.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	14,700	375	2,940	1.71	1.97
November	4,360	570	1,290	0.75	0.84
December	----------	----------	916	0.53	0.61
January	----------	----------	561	0.33	0.38
February	27,900	----------	8,560	4.98	5.18
March	11,500	1,090	5,130	2.98	3.44
April	16,700	805	4,660	2.71	3.02
May	8,800	945	2,390	1.39	1.60
June	4,120	600	1,330	0.77	0.86
July	945	308	471	0.27	0.31
August	2,580	294	634	0.37	0.43
September	6,410	410	1,670	0.97	1.08
The year	27,900	294	2,500	1.45	19.72

NOTES—Gage heights affected by ice December 9, 1917, to February 12, 1918, and discharge estimated from one discharge measurement under ice cover together with climatological records. Maximum 43,900 second-feet February 20. Minimum 285 second-feet August 6.

OHIO BASIN—STATION NO. 19

ALLEGHENY RIVER AT FREEPORT

DESCRIPTION OF STATION

Location.—At three span, steel, through truss, county highway bridge at Freeport, Armstrong County.

Records Available.—Discharge measurements from March, 1912, to July, 1917, and gage heights of the Water Supply Commission

from March 21, 1915, to September 30, 1918. Gage heights have been observed by the U. S. Weather Bureau since April 16, 1873. For other records on this river see Allegheny River at Larabee, Franklin and Kittanning; also Allegheny River at Red House, N. Y., in the 1911 to 1914 reports of the Water Supply Commission.

Drainage Area.—11,400 square miles, including Buffalo Creek.

Gage.—A staff gage, whose elevation of zero is 734.98 feet above mean sea level, is located on the first pier from the right bank and is read twice daily by an employe of the U. S. Engineer Office, Pittsburgh.

Channel.—The right bank is high, clean and liable to overflow in extreme stages. The left bank is high, clean and does not overflow and the bed is composed of sand, gravel and mud.

Remarks.—In connection with discharge measurements of the Allegheny River at Freeport, measurements are obtained of Buffalo Creek from a two span, steel, through truss, highway bridge at Lane Station, a short distance above the mouth, the combined discharge representing the run-off from the drainage area above Freeport. This station is maintained in co-operation with the U. S. Engineer Office in Pittsburgh.

Discharge Measurement of Allegheny River at Freeport, Armstrong County
(Drainage area, 11,400 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1916		Sq. ft.	Feet	Sec.-ft.	
16	July 9	Wilson	9,704	5.42	15,579	Surface method
		Buffalo Creek (msmd.)			65	
		Total			15,641	

Daily Mean Gage Heights, in feet, of Allegheny River at Freeport, Armstrong County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	2.2	3.2	9.8	7.2	8.4	11.2	9.3	4.3	11.4	8.2	3.8	2.9
2	2.0	2.4	8.9	6.5	9.6	10.3	9.0	4.1	12.4	7.2	3.7	2.8
3	1.8	2.2	7.4	6.3	8.6	9.0	9.4	4.1	11.4	8.1	3.3	2.8
4	1.6	2.0	6.4	7.5	6.6	8.1	9.6	4.0	9.8	9.0	3.4	2.8
5	1.6	2.4	5.4	8.2	6.5	7.3	9.1	4.3	8.4	8.0	3.0	3.0
6	1.6	2.6	5.3	15.3	9.6	6.5	9.2	5.9	8.3	6.4	2.8	4.0
7	1.5	2.4	5.3	15.0	*	5.9	11.2	7.7	10.8	5.4	2.7	4.3
8	1.5	2.3	5.2	12.7	-------	5.8	10.9	8.4	15.5	5.2	2.8	4.8
9	1.4	2.2	4.8	10.8	-------	7.3	10.6	8.5	14.4	5.4	2.8	5.9
10	‡1.3	2.2	4.5	9.4	-------	7.5	9.6	8.0	13.5	7.6	2.9	4.4
11	1.3	2.2	4.6	8.4	-------	8.0	8.6	7.9	13.3	10.9	2.8	3.8
12	1.3	2.8	4.8	7.4	-------	15.2	7.8	7.4	13.1	11.0	2.8	3.8
13	1.3	3.0	4.4	5.9	-------	†17.8	7.4	6.7	10.1	10.2	2.6	2.8
14	1.4	3.0	4.3	5.6	-------	15.1	7.0	6.3	9.3	9.4	3.8	2.7
15	1.4	3.0	4.2	5.5	-------	14.3	6.6	5.6	8.2	10.4	5.6	2.5
16	1.5	3.4	4.0	*	-------	13.2	6.2	5.2	7.3	10.1	6.1	2.5
17	2.0	3.4	3.8	-------	-------	11.6	5.8	4.8	6.4	10.0	5.2	2.4
18	2.2	3.3	3.8	-------	-------	12.4	5.3	4.7	6.0	8.8	4.8	2.4
19	2.6	3.0	3.8	-------	9.5	12.3	5.2	4.4	5.2	7.8	4.6	2.2
20	3.2	3.0	3.8	3.5	9.5	10.8	5.2	4.4	5.0	7.1	4.3	1.8
21	4.9	2.9	4.0	-------	9.8	9.6	5.6	4.9	4.4	6.8	4.0	1.7
22	5.0	2.8	4.8	14.6	-------	9.4	5.8	6.4	4.3	6.4	3.5	1.7
23	4.8	2.9	6.5	12.0	-------	9.4	5.4	7.7	4.2	6.3	3.7	2.0
24	4.2	3.4	5.7	8.6	10.9	11.5	5.2	8.6	4.0	6.2	4.7	2.0
25	3.4	5.3	5.6	7.5	13.6	14.7	4.8	8.3	5.2	5.4	4.4	1.7
26	3.2	6.5	5.0	6.7	11.9	13.4	5.0	8.3	5.5	5.0	4.0	1.7
27	3.0	6.1	5.5	6.2	9.3	12.0	5.0	8.4	6.5	4.8	3.5	1.8
28	2.8	5.2	10.9	5.6	14.0	11.2	4.8	8.0	11.3	5.2	3.0	1.8
29	2.6	5.3	11.8	5.5	-------	11.0	4.6	10.0	10.2	5.6	2.8	1.8
30	2.4	7.5	9.6	6.1	-------	10.8	4.4	12.3	9.6	4.8	3.1	1.8
31	2.4	-------	8.2	7.6	-------	10.2	-------	11.6	-------	4.3	2.9	-------

NOTES—*River frozen January 16 to 21, and February 7 to February 26, 1917 inclusive. †Maximum 18.5 feet at 2 a. m. estimated from hydrograph. ‡Minimum 1.3 feet October 10 to 13, 1916.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.6	16.8	3.4	10.0	8.5	12.7	4.4	5.3	7.6	3.9	2.9	4.6
2	1.6	14.3	3.5	9.0	8.5	16.8	4.3	5.1	6.5	3.9	3.0	3.8
3	1.6	12.1	3.4	9.0	8.5	14.0	4.3	5.1	5.8	3.6	2.6	2.9
4	2.4	10.3	3.8	9.0	8.5	12.0	4.4	5.0	5.1	3.4	2.4	2.6
5	2.7	9.0	3.3	8.5	8.5	11.6	4.7	4.2	4.7	3.1	2.4	2.8
6	3.0	7.9	3.8	8.5	8.5	11.7	5.0	4.2	4.8	2.8	2.7	2.6
7	3.0	7.0	3.8	8.5	8.5	11.9	4.6	4.0	4.7	2.6	2.6	2.6
8	3.0	6.4	3.8	8.5	8.6	12.2	4.8	4.0	5.2	2.4	2.9	3.0
9	2.9	5.8	*3.6	8.5	6.6	10.9	5.3	4.0	4.8	2.3	3.6	3.0
10	2.8	5.4	3.5	8.5	10.4	11.6	6.3	4.0	4.2	2.0	3.6	2.8
11	2.7	5.0	3.5	8.5	10.9	14.4	6.2	4.0	4.2	2.0	3.7	2.6
12	2.8	4.9	3.5	8.5	19.5	12.9	6.4	5.0	4.2	1.7	3.6	2.6
13	3.0	4.8	-------	8.5	14.0	11.8	6.7	5.7	4.0	1.7	3.4	2.7
14	3.1	4.4	-------	8.5	13.1	13.2	7.5	8.8	5.2	1.6	3.0	4.0
15	3.3	4.2	-------	8.5	16.4	23.8	9.2	9.4	4.7	1.8	2.9	3.9
16	3.4	4.2	-------	8.5	16.6	20.8	10.0	8.0	4.2	1.8	3.2	3.6
17	3.8	3.8	-------	8.5	13.4	17.3	9.8	7.1	4.0	1.8	2.9	3.8
18	4.2	3.8	-------	8.5	11.0	14.5	10.7	6.0	3.5	1.8	2.8	6.1
19	4.6	3.6	-------	8.5	9.6	11.8	9.8	5.2	3.6	1.7	2.6	6.0
20	10.2	3.5	-------	8.5	†22.3	10.3	9.5	5.0	3.4	1.6	2.2	5.9
21	10.4	3.4	-------	9.5	24.2	9.1	8.1	5.0	3.1	1.6	2.2	5.7
22	9.3	3.4	-------	8.5	16.5	8.2	7.9	6.1	2.9	‡1.5	2.1	5.6
23	7.8	3.5	-------	8.5	14.0	7.5	7.4	7.0	7.2	‡1.5	2.3	5.7
24	8.2	3.4	-------	8.5	12.0	7.0	7.2	7.8	6.9	‡1.5	2.0	5.7
25	14.1	3.5	5.8	8.5	10.9	6.6	7.2	7.0	6.2	2.1	1.8	5.0
26	15.8	3.7	7.4	8.5	13.6	6.2	6.8	7.8	5.4	2.6	1.8	4.4
27	14.6	3.5	9.0	8.5	15.1	5.8	6.2	8.2	4.6	2.5	1.8	4.2
28	15.7	3.4	10.3	8.5	12.8	5.5	5.8	7.8	4.2	2.4	1.8	4.1
29	16.0	3.1	11.2	8.5	-------	5.2	5.5	7.8	3.8	2.4	1.8	4.0
30	16.0	3.2	11.4	8.5	-------	5.0	5.4	8.8	3.7	2.6	2.6	4.0
31	19.1	-------	-------	8.5	-------	4.8	-------	8.5	-------	2.6	2.7	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 13, 1918. †Maximum 26.8 feet from hydrograph at 11 p. m. ‡Minimum 1.5 feet.

OHIO BASIN—STATION NO. 20

DUNKARD CREEK AT "BOBTOWN"

DESCRIPTION OF STATION

Location.—At single span, wooden covered bridge, about two miles above the mouth, at "Bobtown", Greene County.

Records Available.—Discharge measurements and gage heights from October 14, 1909, to September 30, 1918.

Drainage Area.—230 square miles.

Gage.—A staff gage, whose elevation of zero is arbitrary, is located on the downstream wing of the left abutment and is read twice daily by Mrs. Enlow Stoneking.

Channel.—Both banks are high and do not overflow; bed is rocky; section is deep and current sluggish at low stages.

Discharge Measurements of Dunkard Creek at "Bobtown," Greene County
(Drainage area, 230 square miles)

No.	Date	Hydrographer	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
8	April 14	Reckord	416	1.93	144	Surface method.
9	June 29	Wilson	53	1.43	55	Wading 200 ft. below gage.
	1918					
10	July 12	Landis	12	0.84	3.6	Wading 100 ft. below gage.

Daily Mean Gage Heights, in feet, of Dunkard Creek at "Bobtown" Greene County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.12	1.04	1.65	2.20	2.92	2.63	1.76	2.19	3.32	1.32	1.07	2.95
2	1.04	1.02	1.61	2.05	2.56	2.54	1.72	2.05	4.67	1.23	1.03	2.12
3	0.98	1.00	1.56	2.42	2.10	2.52	1.69	1.92	3.74	1.14	0.99	1.76
4	0.92	1.22	1.51	3.50	2.40	2.70	1.64	1.81	2.85	1.09	0.96	1.67
5	0.86	2.21	1.50	4.32	2.12	3.05	1.57	1.76	2.26	1.04	0.92	1.52
6	0.84	2.05	1.47	4.32	*2.02	2.52	2.75	1.80	3.52	0.99	0.86	1.56
7	0.81	1.70	1.44	3.25	1.98	2.86	3.95	1.74	5.55	1.01	0.83	1.66
8	0.78	1.52	1.40	2.68	1.90	5.58	3.28	1.70	3.70	1.14	0.84	2.90
9	0.76	1.44	1.40	2.36	1.82	4.60	2.76	1.80	3.32	1.28	0.90	2.35
10	0.73	1.46	1.40	2.22	1.86	3.76	2.56	2.06	3.72	2.30	0.86	1.92
11	0.72	1.95	1.38	2.06	1.78	4.90	2.36	1.96	3.62	1.71	0.85	1.66
12	‡0.72	1.80	1.37	1.78	1.82	4.30	2.18	1.86	2.98	1.56	0.82	1.54
13	0.72	1.61	1.36	1.73	1.76	4.78	2.04	1.74	2.52	1.41	0.80	1.38
14	0.72	1.54	*1.46	2.20	1.58	5.22	1.95	1.70	2.19	1.82	0.98	1.29
15	0.72	1.60	1.44	2.58	1.41	3.62	1.86	1.64	1.98	2.48	1.14	1.22
16	0.76	1.70	1.41	2.69	1.64	2.90	1.79	1.54	1.84	2.62	1.40	1.14
17	0.82	1.64	1.40	2.64	1.76	2.79	1.72	1.48	1.76	2.32	1.54	1.11
18	0.90	1.56	1.42	2.54	1.82	2.72	1.64	1.42	1.64	2.06	1.40	1.07
19	1.75	1.52	1.46	2.44	1.96	2.60	1.60	1.38	1.52	2.05	1.24	1.04
20	2.42	1.44	1.49	2.49	2.02	2.55	1.58	1.34	1.44	1.89	1.09	1.01
21	2.33	1.36	1.64	2.26	2.06	2.53	1.55	1.30	1.38	1.86	1.02	0.97
22	1.98	1.31	4.08	†9.16	1.95	2.51	1.51	1.30	1.35	1.64	0.94	0.94
23	1.70	1.33	3.10	3.50	1.90	2.42	1.48	1.34	1.28	1.48	0.93	0.92
24	1.56	2.25	2.72	2.92	4.59	3.18	1.50	1.39	1.22	1.34	1.75	0.90
25	1.46	2.58	2.32	2.58	3.30	3.05	1.62	1.36	1.20	1.24	2.54	0.88
26	1.36	2.05	2.10	2.30	2.76	2.62	1.84	1.30	1.16	1.19	1.98	0.86
27	1.27	1.88	4.18	2.26	2.73	2.38	1.98	1.36	1.11	1.16	1.46	0.86
28	1.18	1.73	5.62	2.55	2.72	2.25	1.93	3.32	1.06	1.15	1.32	0.88
29	1.12	1.63	3.78	2.94	-------	2.09	2.07	3.60	1.42	1.14	1.19	0.86
30	1.10	1.66	2.88	4.22	-------	1.98	2.25	2.92	1.39	1.19	1.11	0.84
31	1.07	-------	2.32	3.32	-------	1.85	-------	2.40	-------	1.12	1.17	-------

NOTES—*Creek frozen December 14 to 22, 1916 and February 6 to 24, 1917 inclusive. †Maximum 10.50 feet at 9:00 a. m. ‡Minimum 0.71 feet October 12-13, 1916.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.84	2.41	1.24	2.90	3.82	2.62	1.34	2.02	1.87	0.97	1.22	2.00
2	0.82	2.16	1.52	2.79	3.66	2.52	1.44	2.00	1.66	0.88	1.08	1.82
3	0.82	1.94	1.47	2.56	3.54	2.44	1.66	1.94	1.50	0.83	0.96	1.51
4	0.86	1.86	1.44	2.49	3.58	2.32	1.97	1.87	1.42	0.80	0.92	1.41
5	0.86	1.73	1.40	2.42	3.49	3.00	1.95	1.72	1.34	0.81	0.84	1.36
6	0.84	1.59	1.38	2.38	3.47	2 86	1.79	1.62	1.29	0.86	0.80	1.29
7	0.83	1.56	1.38	2.36	5.34	2.70	1.74	1.58	1.32	0.82	1.08	1.18
8	0.81	1.52	1.36	3.05	5.38	2.46	2.70	1.91	1.32	0.77	1.28	1.05
9	0.82	1.47	1.35	3.06	6.20	2.50	4.20	2.20	1.28	0.75	1.10	0.97
10	0.84	1.42	*1.37	3.01	4.94	3.78	2.78	2.20	1.25	0.74	1.35	0.94
11	0.84	1.37	1.41	3.01	3.68	3.05	3.18	2.99	1.29	0.74	1.75	0.90
12	1.02	1.35	1.40	3.80	3.42	2.73	4.45	2.32	1.25	0.82	*1.38	0.90
13	1.22	1.33	1.40	4.06	4.21	2.90	4.25	2.36	1.16	0.82	1.32	0.88
14	1.47	1.30	1.42	3.68	3.42	5.62	3.62	2.55	1.12	0.80	1.82	0.86
15	1.34	1.27	1.44	3.53	3.96	2.85	2.33	2.74	1.06	0.77	1.56	0.84
16	1.24	1.24	1.48	3.75	3.47	2.58	2.56	2.38	1.01	0.74	1.32	0.80
17	1.12	1.20	1.50	3.78	2.78	2.42	2.42	2.16	1.14	0.70	1.19	1.05
18	1.06	1.20	1.50	3.42	2.38	2.34	2.26	2.02	1.12	0.70	1.08	1.02
19	1.81	1.20	1.50	3.02	2.77	2.16	2.08	1.92	1.10	0.74	0.88	0.99
20	3.08	1.20	1.50	2.90	†5.53	2.02	1.98	1.76	1.05	0.70	0.80	1.08
21	2.48	1.18	1.53	2.80	3.76	1.94	1.95	1.78	1.12	0.66	0.80	1.09
22	1.99	1.20	1.93	2.68	2.90	1.86	1.98	2.02	1.22	0.63	0.80	1.08
23	1.76	1.25	3.10	2.60	2.56	1.80	1.94	2.49	1.18	‡0.62	0.78	1.04
24	2.07	1.23	2.90	2.49	2.56	1.72	1.88	2.32	1.12	0.78	0.77	1.00
25	3.45	1.21	2.64	2.34	3.03	1.65	1.82	2.18	1.06	1.00	0.76	1.00
26	3.26	1.20	3.20	2.34	†5.38	1.58	1.76	2.60	1.02	1.06	0.74	0.99
27	2.75	1.20	3.44	2.34	3.45	1.54	1.76	2.21	0.98	0.98	0.72	0.96
28	3.22	1.22	3.42	2.82	2.82	1.50	1.73	1.96	0.94	0.83	0.76	0.92
29	2.60	1.23	3.23	3.70	-------	1.44	1.70	2.28	0.89	0.74	1.02	0.90
30	2.72	1.24	3.16	4.76	-------	1.36	2.12	2.56	0.86	1.00	1.40	0.86
31	2.58	-------	3.02	4.59	-------	1.34	-------	2.10	-------	1.37	1.80	-------

NOTES—*Gage heights affected by ice December 10, 1917 to February 9, 1918, †Maximum 6.8 feet from hydrograph at noon February 20 and 10 a. m. February 26. ‡Minimum 0.62 foot.

OHIO BASIN—STATION NO. 21

SOUTH FORK TEN MILE CREEK AT POLLOCK'S MILL

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge about two miles below Jefferson, Greene County.

Records Available.—Discharge measurements and gage heights from June 22, 1915, to September 30, 1918.

Drainage Area.—190 square miles.

Gage.—A staff gage, whose elevation of zero is arbitrary, is on the right abutment and is read twice daily by James M. Pollock.

Channel.—The right bank is high and does not overflow, the left is low and overflows with backwater from below. The bed is rocky, rough and probably permanent.

Remarks.—This station is maintained in co-operation with the U. S. Engineer Office in Pittsburgh.

Discharge measurements of South Fork Ten Mile Creek at Pollock's Mill, Greene County
(Drainage area, 190 square miles)

No.	Date	Hydrographer	Area	G. H.	Dis.	Remarks
			Sq. ft.	Feet	Sec.-ft.	
5	1918 July 13	Landis	8	0.70	5	Wading 100 yards below bridge.

Daily Mean Gage Heights, in feet, of South Fork-Ten Mile Creek at Pollock's Mill, Greene County, for the year ending September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	1.2	2.1	1.3	*1.5	3.0	2.2	1.3	1.4	1.8	0.7	1.2	2.8
2	1.2	1.8	1.3	1.5	3.0	2.0	1.3	1.5	1.6	0.8	1.1	2.2
3	1.2	1.8	1.3	1.5	3.0	2.0	1.4	1.4	1.4	1.0	1.0	1.7
4	1.2	1.8	1.2	1.5	3.0	1.8	1.5	1.3	1.3	1.0	1.0	1.4
5	1.4	1.6	1.2	1.5	3.0	2.2	1.4	1.4	1.2	0.9	0.9	1.6
6	1.4	1.6	1.2	1.5	3.5	2.0	1.3	1.3	1.3	0.9	0.8	1.2
7	1.3	1.5	1.2	1.5	3.7	1.8	1.2	1.4	1.2	0.8	0.8	1.1
8	1.3	1.5	*1.3	1.5	6.0	1.7	3.0	1.5	1.1	0.7	0.7	1.0
9	1.2	1.5	1.3	1.5	6.2	1.8	1.2	1.4	1.1	0.6	0.6	0.8
10	1.2	1.5	1.3	1.5	4.8	5.8	1.4	1.6	1.1	0.6	0.9	0.7
11	1.2	1.5	1.3	1.5	3.4	3.8	1.6	2.0	1.0	0.6	2.4	0.8
12	1.4	1.4	1.3	1.5	3.3	2.4	3.2	2.7	1.1	0.8	1.9	1.0
13	1.8	1.4	1.3	1.5	4.2	2.2	3.8	3.6	1.0	0.7	1.6	1.4
14	1.6	1.4	1.3	1.5	4.6	5.8	3.0	4.7	1.0	0.6	1.4	1.6
15	1.4	1.4	1.3	1.5	4.0	2.7	2.8	3.4	0.8	0.6	1.4	1.4
16	1.3	1.4	1.3	1.5	3.4	2.2	2.4	3.1	0.8	0.6	1.7	1.4
17	1.2	1.4	1.3	1.5	2.9	2.2	2.2	2.4	0.9	0.5	1.6	3.2
18	1.0	1.3	1.3	1.5	2.6	2.0	2.0	1.9	1.0	0.4	1.4	2.4
19	3.5	1.3	1.2	1.5	3.4	1.8	1.8	1.6	0.9	0.4	1.2	1.8
20	1.4	1.3	1.4	1.5	†5.5	1.8	1.7	1.4	0.9	0.4	1.0	2.2
21	3.4	1.2	1.3	1.5	3.6	1.6	1.6	1.4	0.8	‡0.3	1.0	2.0
22	1.9	1.3	2.3	1.5	2.9	1.6	1.7	1.6	0.9	‡0.3	0.8	1.8
23	1.7	1.3	2.0	1.5	2.6	1.5	1.6	1.8	1.0	‡0.3	0.8	1.6
24	1.9	1.2	2.1	1.5	2.0	1.4	1.6	1.6	0.9	0.8	0.6	1.2
25	3.9	1.2	2.2	1.5	2.2	1.6	1.5	4.0	0.8	1.1	0.5	0.8
26	2.7	1.2	2.5	1.5	5.5	1.6	1.4	2.0	0.8	1.2	0.4	0.7
27	2.4	1.2	2.5	1.5	3.4	1.6	1.3	1.8	0.7	1.1	0.4	0.6
28	3.0	1.3	2.5	1.5	2.4	1.5	1.4	1.8	0.7	1.2	0.4	0.8
29	2.3	1.3	2.5	2.2	-------	1.4	1.5	4.0	0.6	1.2	0.4	1.0
30	2.4	1.4	2.5	3.8	-------	1.4	1.4	3.2	0.6	1.1	0.6	0.8
31	2.6	-------	2.5	3.0	-------	1.3	-------	2.0	-------	1.0	3.2	-------

NOTES—*Gage heights affected by ice December 8, 1917, to February 9, 1918. †Maximum 6.1 feet from hydrograph at 5 a. m. ‡Minimum 0.3 foot.

OHIO BASIN—STATION NO. 22

MONONGAHELA RIVER AT SOUTH BROWNSVILLE

DESCRIPTION OF STATION

Location.—At four span, steel, through truss, highway bridge, known as "Brownsville Bridge", one quarter mile below Lock No. 5, South Brownsville, Fayette County.

Records Available.—Discharge measurements and gage heights from February 18, 1915, to September 30, 1918.

Drainage Area.—5,130 square miles.

Gage.—A staff gage, whose elevation of zero is 726.23 feet above mean sea level, is located on the downstream side of Lock No. 5, and is read twice daily by Charles W. Keibler.

Channel.—The right bank is high and not subject to overflow. The left bank overflows at extreme stages. The bed is composed of sand, gravel and mud.

Remarks.—This station is maintained in co-operation with the U. S. Engineer Office in Pittsburgh.

Discharge Measurements of Monongahela River at South Brownsville, Fayette County
(Drainage area, 5,130 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
			Sq. ft.	Feet	Sec.-ft.	
15	Mar. 14	Comstock	19,070	33.30	94,574	Surface method
16	April 15	Reckord	4,382	9.85	9,077	Surface method
17	June 30	Wilson	4,255	9.70	1,722	0.2 & 0.8 method
	1918					
18	July 13	Landis	4,011	9.70	1,420	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Monongahela River at South Brownsville, Fayette County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept
1916-1917												
1	12.8	10.8	11.6	13.6	15.2	17.8	8.1	12.4	16.2	10.0	10.7	10.0
2	12.2	10.4	11.7	12.8	13.8	16.2	7.8	12.2	16.6	10.0	10.4	10.4
3	11.6	10.6	11.7	12.8	12.7	14.9	7.6	11.6	14.8	9.9	10.4	11.0
4	11.3	10.8	11.6	17.6	11.6	15.6	7.4	11.2	13.9	9.6	10.6	10.8
5	11.1	11.6	11.5	18.8	*12.0	18.6	7.2	11.0	12.8	9.4	10.3	10.4
6	10.8	11.3	11.4	20.0	11.6	17.6	8.8	11.0	12.2	9.2	10.3	10.2
7	10.8	11.0	12.2	19.1	11.3	15.8	14.7	10.9	17.4	9.1	10.0	10.8
8	10.6	11.0	12.2	16.6	11.0	21.4	15.3	10.8	17.2	9.0	10.0	11.0
9	10.6	10.8	11.9	14.4	11.4	29.2	14.9	10.8	14.4	9.0	10.1	11.6
10	10.6	10.8	11.6	13.6	11.4	23.0	12.8	11.2	14.1	10.0	10.2	11.8
11	10.6	11.1	11.6	12.8	10.9	21.0	11.0	11.7	14.6	10.6	10.3	11.5
12	10.6	11.1	11.5	12.1	10.5	30.2	10.6	11.8	14.0	10.5	10.4	11.1
13	10.6	11.2	11.4	11.6	10.2	33.9	11.2	11.4	12.8	10.2	10.3	10.6
14	10.6	11.0	11.4	11.6	9.9	32.8	10.8	11.2	11.7	10.2	11.4	10.4
15	10.6	11.1	11.4	12.6	10.0	27.6	9.7	11.0	11.1	10.7	11.4	10.9
16	10.7	11.2	11.0	13.2	10.0	20.6	8.7	10.8	10.8	14.1	10.6	10.0
17	11.4	11.1	11.0	12.8	10.0	16.8	8.0	10.6	10.6	13.4	10.4	9.8
18	13.4	11.1	*11.0	12.4	10.0	17.2	7.4	10.4	10.4	12.2	10.0	9.6
19	13.2	11.0	11.0	*12.1	10.6	16.2	7.2	10.2	10.2	11.7	9.9	9.5
20	15.2	11.0	11.2	12.0	11.8	14.3	‡6.6	10.0	10.0	11.6	9.9	9.4
21	14.6	11.0	11.2	11.6	13.2	13.4	7.0	10.0	9.6	11.4	9.9	9.4
22	13.7	10.8	14.2	†36.5	14.1	13.0	8.1	9.8	9.4	11.2	9.9	9.3
23	12.8	10.8	20.6	32.0	13.0	14.2	9.2	9.8	9.4	1.2	10.1	9.2
24	12.1	11.0	17.2	20.3	16.0	14.8	10.0	9.8	9.6	11.1	10.2	9.2
25	11.7	12.6	14.6	15.5	19.9	16.9	10.3	10.0	9.4	10.8	10.4	9.2
26	11.4	13.1	13.3	13.6	17.6	15.8	11.0	10.0	9.2	10.8	10.2	9.4
27	11.4	12.6	15.0	12.4	14.8	13.8	10.8	10.0	9.6	11.4	10.0	9.6
28	11.2	12.0	22.0	12.1	17.0	11.0	10.6	24.6	9.4	12.0	9.9	9.9
29	11.0	11.7	25.0	12.8	-------	9.9	10.6	28.2	9.4	11.7	9.8	9.9
30	11.0	11.6	19.8	15.3	-------	9.2	11.2	25.6	9.7	11.4	9.7	10.0
31	10.9	-------	15.6	15.8	-------	8.6	-------	19.2	-------	11.0	9.7	-------

NOTES—*River frozen December 18 to 22, 1916; January 19 and 20, and February 5 to 24, 1917, inclusive. †Maximum 41.7 feet at 8 p. m. ‡Minimum 6.0 feet at 8 p. m.

Daily Mean Gage Heights, in feet, of Monongahela River at South Brownsville, Fayette County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917–1918												
1	10.0	13.4	11.7	10.4	17.5	15.8	10.4	12.2	12.2	13.4	10.6	12.0
2	10.0	13.0	12.2	10.4	14.8	14.6	10.4	12.0	11.6	12.6	10.4	12.4
3	9.9	12.3	12.2	10.4	12.3	14.1	10.0	11.8	10.9	11.8	10.4	12.0
4	10.0	12.0	12.0	10.2	12.5	13.2	10.5	11.6	10.5	11.2	10.2	11.4
5	10.0	11.7	11.8	10.2	12.7	13.4	11.3	11.2	10.2	10.8	10.0	11.0
6	10.0	11.4	11.6	10.2	11.6	14.7	11.5	11.0	10.1	10.5	10.1	10.8
7	10.0	11.2	11.4	10.2	13.1	14.9	11.1	10.8	9.6	10.4	10.0	10.6
8	10.0	11.1	11.2	10.4	19.8	15.4	11.0	11.6	13.7	10.3	10.1	10.4
9	10.0	11.0	11.0	11.2	22.8	15.2	15.1	17.8	13.1	10.0	10.1	10.3
10	10.0	10.8	10.8	12.0	26.9	16.4	19.1	16.0	11.6	9.9	10.2	10.2
11	10.0	10.8	*10.7	11.3	23.7	16.5	17.6	14.4	10.8	9.8	11.5	10.2
12	10.0	10.8	10.5	11.2	20.6	15.0	19.0	13.3	10.4	9.7	11.2	10.2
13	10.0	10.6	10.5	12.6	21.8	14.7	18.7	12.8	10.1	9.7	10.9	10.2
14	10.0	10.6	10.5	13.8	20.0	†38.3	17.5	14.0	10.0	‡9.6	10.9	10.2
15	10.0	10.6	10.4	13.5	19.3	32.9	17.3	16.2	9.8	10.0	10.9	10.1
16	10.1	10.6	10.4	13.9	19.4	23.6	18.0	15.1	9.7	10.1	11.4	10.2
17	10.2	10.4	10.4	14.8	16.6	17.5	17.2	13.5	12.6	10.2	11.2	10.5
18	10.2	10.4	10.4	13.8	14.3	14.8	16.2	12.6	14.8	10.2	11.0	10.7
19	10.6	10.4	10.4	12.9	13.6	13.4	15.0	11.8	13.9	10.1	10.6	11.4
20	12.4	10.4	10.4	11.4	24.7	12.4	13.6	11.3	12.6	10.0	10.5	12.4
21	12.2	10.2	10.3	10.7	27.8	11.8	13.0	11.2	11.6	10.1	10.6	12.2
22	12.2	10.0	10.4	10.5	19.2	11.6	14.3	11.3	11.0	10.0	10.6	12.3
23	11.6	10.3	10.6	10.3	15.3	12.3	15.0	12.0	10.6	10.1	10.6	12.2
24	11.4	10.3	10.8	10.0	13.9	12.0	14.2	12.6	11.2	10.2	10.5	11.6
25	12.6	10.3	11.2	9.7	14.2	11.5	13.4	12.8	11.1	10.2	10.3	11.1
26	13.2	10.2	13.6	10.0	24.9	11.3	12.9	22.1	10.6	10.3	10.3	10.7
27	13.2	10.3	14.7	10.2	28.1	11.2	13.0	21.2	10.6	10.4	10.2	10.7
28	13.7	10.3	12.9	12.0	19.8	11.1	12.8	16.4	12.2	10.3	10.2	10.5
29	13.6	10.3	12.7	23.6	-------	10.8	13.0	14.6	11.4	10.2	10.2	10.4
30	13.4	10.5	12.0	26.9	-------	10.6	12.6	14.0	12.8	10.4	10.2	10.5
31	13.4	-------	10.6	21.8	-------	10.6	-------	12.9	--- ---	10.4	11.2	-------

NOTES—*Gage heights affected by ice December 11, 1917 to February 14, 1918. †Maximum 40.0 feet at 3 p. m. ‡Minimum 9.5 feet.

OHIO BASIN—STATION NO. 23

YOUGHIOGHENY RIVER NEAR CONFLUENCE

DESCRIPTION OF STATION

Location.—At two span, steel, through truss, highway bridge about one half mile from Confluence, Somerset County.

Records Available.—Discharge complete from September 15, 1904, to September 30, 1914, and discharge measurements and gage heights from October 1, 1914, to September 30, 1918. For other records on this river see Youghiogheny River at Connellsville and Sutersville; also Youghiogheny River at Friendsville, Md., in the 1910-11 Report of the Water Supply Commission.

Drainage Area.—435 square miles.

Gage.—A standard chain gage, whose elevation of zero is 1,309.79 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by Walter Shipley.

Channel.—The right bank is high and does not overflow; the left is low, clean and overflows during high stages, and the bed is rocky.

Remarks.—There is a small cobblestone dam 4 to 6 inches high under the bridge.

Discharge Measurements of Youghioghony River near Confluence, Somerset County
(Drainage area, 435 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
32	April 13	Reckord	605	3.96	1,569	0.2 & 0.8 method
33	June 27	Wilson	148	1.94	148	0.6 method
	1918					
34	Feb. 3	Wilson	215	3.60	204	Under ice cover
35	July 10	Landis	106	1.71	100	Wading measurement

Daily Mean Gage Heights, in feet, of Youghioghony River near Confluence, Somerset County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	2.49	2.04	2.73	3.7	4.6	4.1	2.96	2.66	4.8	1.80	1.80	1.85
2	2.29	1.99	2.68	3.4	3.9	4.4	2.76	2.51	4.2	1.70	1.75	1.70
3	2.14	1.99	2.58	4.3	3.6	4.2	2.56	2.36	3.9	1.60	1.70	1.60
4	1.99	2.29	2.53	4.6	3.3	3.8	2.46	2.56	3.4	1.60	1.75	1.55
5	1.94	2.79	2.63	5.2	3.4	3.3	2.76	2.76	3.2	1.55	1.80	1.55
6	1.84	2.59	2.58	5.6	3.1	2.97	3.0	2.76	4.8	1.55	1.70	1.50
7	1.74	2.39	2.48	5.4	*6.4	3.7	3.3	2.66	7.4	1.70	1.65	2.10
8	1.69	2.19	2.43	4.9	5.9	4.9	3.6	2.76	5.2	1.60	1.60	3.3
9	1.79	2.19	2.58	4.3	5.6	5.0	3.8	2.91	4.4	1.70	1.80	3.5
10	1.89	2.64	2.43	3.9	5.2	4.4	3.5	3.1	4.0	1.95	1.70	3.2
11	2.24	2.79	2.23	3.3	4.9	6.2	3.7	3.0	3.6	1.90	1.65	2.60
12	2.04	2.59	2.38	2.78	4.6	13.5	3.8	2.81	3.2	1.80	1.60	2.20
13	1.99	2.49	2.23	2.78	4.4	7.7	3.9	2.76	2.95	1.75	1.55	2.05
14	1.89	2.44	2.33	3.1	4.2	6.7	3.4	2.71	2.80	1.80	1.60	1.90
15	1.99	2.39	2.53	3.5	4.0	6.5	3.3	2.61	2.65	2.10	1.80	1.85
16	2.19	2.34	2.68	3.5	3.9	6.0	3.1	2.56	2.60	3.7	1.75	1.80
17	3.4	2.29	2.38	3.4	4.1	7.4	2.90	2.36	2.59	3.0	1.70	1.75
18	3.4	2.20	2.58	3 2	4.4	6.1	2.56	2.31	2.40	2.80	1.65	1.70
19	3.8	2.24	2.68	2.98	4.8	5.2	2.86	2.21	2.35	2.70	1.60	1.65
20	3.8	2.24	2.48	2.78	4.9	4.9	2.76	2.16	2.25	2.55	1.69	1.65
21	3.7	2.19	3.3	3.7	5.1							
22	3.3	2.14	6.3	†15.8	4.7	4.5	2.61	2.16	2.20	2.30	1.55	1.60
23	2.99	2.19	4.2	7.0	4.9	5.2	2.51	2.31	2.15	2.20	1.60	1.55
24	2.79	2.39	3.8	5.1	8.4	4.9	2.86	2.36	2.05	2.40	1.55	1.50
25	2.64	2.99	5.6	4.5	4.2	4.7	2.61	2.26	2.00	2.30	1.50	1.50
26	2.59	2.79	3.8	3.8	3.7	4.6	2.56	2.16	1.80	2.25	1.50	1.55
27	2.49	2.74	5.8	3.5	4.8	4.0	2.51	3.1	1.94	2.15	‡1.45	1.55
28	2.34	2.64	5.3	3.3	4.5	3.7	2.66	7.0	1.90	2.10	1.45	1.50
29	2.24	2.64	4.9	3.2	-------	3.4	2.86	6.8	1.90	2.00	1.45	1.50
30	2.14	2.84	4.7	4.9	-------	3.2	2.86	5.5	1.90	1.95	1.60	‡1.45
31	2.09	-------	4.2	4.2	-------	3.1	-------	4.2	-------	1.85	1.80	-------

NOTES—*River frozen February 7 to 24, 1917 inclusive. †Maximum 15.8 feet at 2 p. m. ‡Minimum 1.45 feet August 27-29 and September 30, 1917.

Daily Mean Gage Heights, in feet, of Youghiogheny River near Confluence, Somerset County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.45	2.95	2.42	3.4	3.7	5.4	2.25	2.85	3.1	1.96	2.11	2.52
2	1.50	2.80	2.58	3.3	3.7	5.0	2.31	2.86	2.81	1.92	1.91	2.68
3	1.50	2.65	2.42	3.1	3.6	4.3	2.35	2.75	2.63	1.89	1.73	2.11
4	1.45	2.60	2.31	2.98	3.5	4.0	2.49	2.62	2.51	1.79	1.65	1.91
5	1.55	2.55	2.29	2.88	3.5	4.6	2.47	2.53	2.40	1.73	1.59	1.79
6	1.50	2.40	2.18	2.88	3.6	4.6	2.37	2.47	2.35	1.75	1.55	1.77
7	1.50	2.30	2.12	2.82	3.8	4.5	2.27	2.49	2.49	1.75	1.53	1.72
8	1.45	2.25	2.02	2.72	4.8	4.0	2.36	3.4	3.8	1.78	1.81	1.74
9	1.45	2.20	*1.84	2.78	6.3	3.9	3.5	3.6	2.95	1.71	1.73	1.69
10	1.65	2.10	2.08	2.78	11.3	4.6	3.7	3.5	2.65	1.67	1.67	1.59
11	1.60	2.05	2.10	2.82	12.6	4.5	3.6	3.3	2.53	1.75	1.71	1.55
12	1.55	2.00	2.18	2.68	13.1	4.1	3.5	3.1	2.44	1.71	2.26	1.59
13	1.50	1.95	2.22	2.70	10.2	4.4	3.5	3.0	2.33	1.77	1.93	1.65
14	1.65	1.90	2.25	2.90	7.5	8.4	3.8	3.4	2.21	1.78	1.74	1.71
15	1.65	1.85	2.31	3.2	9.7	7.2	6.7	3.3	2.09	1.74	1.90	1.57
16	1.70	1.80	2.28	3.3	7.0	5.5	7.7	3.0	1.94	1.75	1.85	1.55
17	1.65	1.80	2.28	3.4	5.2	4.6	7.2	2.86	2.62	1.70	1.69	1.68
18	1.60	1.75	2.26	3.5	4.5	4.1	6.4	2.75	2.55	1.65	1.59	1.81
19	1.70	1.75	2.30	3.4	4.0	3.6	5.0	2.67	2.47	1.65	1.49	2.64
20	1.65	1.70	2.25	3.2	†13.2	3.4	4.2	2.71	2.18	1.65	1.49	2.76
21	1.60	1.70	2.34	3.1	8.1	3.1	4.6	2.82	1.99	1.70	1.44	2.43
22	1.65	1.65	2.42	3.1	6.0	3.1	4.9	3.1	2.12	1.65	1.45	2.28
23	1.70	1.65	2.47	3.1	4.6	2.93	4.3	3.0	2.20	1.57	1.43	2.07
24	1.80	1.60	2.92	3.1	4.1	2.79	4.0	3.1	2.14	1.53	1.39	1.95
25	1.95	‖1.66	3.4	3.0	4.9	2.72	3.7	3.0	2.03	1.52	1.40	1.87
26	2.45	1.72	3.6	3.0	11.8	2.65	3.4	4.1	1.91	1.59	‡1.36	1.82
27	2.75	1.72	3.1	3.1	7.2	2.57	3.2	3.5	1.89	1.49	1.41	1.75
28	2.85	1.90	2.90	3.2	5.5	2.50	3.1	3.3	1.86	1.61	1.46	1.77
29	3.00	2.11	3.0	3.3	-------	2.45	2.93	3.2	1.85	1.54	1.56	1.68
30	3.20	2.18	3.3	3.8	-------	2.37	2.90	3.2	1.83	1.56	1.51	1.62
31	3.10	-------	3.4	3.8	-------	2.29	-------	3.4	-------	1.77	1.73	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 13, 1918. ‖Interpolated. †Maximum 13.6 feet from hydrograph at 2 p. m. ‡Minimum 1.33 feet.

OHIO BASIN—STATION NO. 24

CASSELMAN RIVER AT MARKLETON

DESCRIPTION OF STATION

Location.—At two span, steel, through truss, highway bridge at B. & O. Railroad Station, Markleton, Somerset County.

Records Available.—Discharge measurements and gage heights from August 13, 1913, to December 31, 1913, and from June 13, 1914, to September 30, 1918. For other records on this river see Casselman River at Confluence in the 1911 to 1913 reports of the Water Supply Commission.

Drainage Area.—365 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the downstream side of the bridge and is read twice daily by N. B. Sanner.

Channel.—Both banks are high and do not overflow, and the bed is composed of gravel and boulders.

Discharge Measurements of Casselman River at Markleton, Somerset County
(Drainage area, 365 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq.ft.	Feet	Sec.-ft.	
6	Apr. 13	Reekord	536	4.20	1,130	0.6 method
7	June 26	Wilson	235	2.47	122	0.2 & 0.8 method
	1918					
8	Feb. 2	Wilson	122	2.42	54	Under ice cover
9	July 10	Landis	205	2.05	60	Wading measurement

Daily Mean Gage Heights, in feet, of Casselman River at Markleton, Somerset County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	2.8	2.4	3.0	3.5	5.1	4.1	3.5	3.1	4.4	2.4	2.1	2.2
2	2.6	2.4	2.9	3.4	4.4	3.9	3.4	3.0	4.2	2.4	2.1	2.1
3	2.4	2.4	2.8	3.9	3.8	3.7	3.3	2.9	4.0	2.3	2.3	2.1
4	2.4	2.4	2.8	4.4	*3.6	3.7	3.2	2.9	3.5	2.2	2.1	2.1
5	2.3	3.0	2.8	4.9	3.4	3.5	3.3	3.1	3.3	2.2	2.0	2.0
6	2.3	2.8	2.7	5.1	3.3	3.2	4.1	3.1	4.7	2.1	2.0	2.0
7	2.2	2.6	2.6	4.4	3.3	3.4	4.3	3.0	6.4	2.2	2.0	2.1
8	2.2	2.4	2.6	3.9	3.3	4.3	4.3	3.0	4.9	2.5	2.1	2.7
9	2.2	2.4	2.6	3.8	3.2	4.3	4.1	3.4	4.4	3.0	2.8	2.7
10	2.3	2.6	*2.6	3.7	3.0	4.0	3.9	3.6	4.2	2.6	2.6	2.4
11	2.2	2.6	2.5	3.4	2.9	5.1	4.0	3.3	3.9	2.6	2.3	2.2
12	2.2	2.5	2.6	*2.9	2.9	8.1	4.3	3.2	3.6	2.6	2.4	2.1
13	2.2	2.5	2.4	3.1	2.9	5.7	4.3	3.1	3.4	2.4	2.2	2.1
14	2.2	2.4	2.5	3.4	2.9	4.9	3.9	3.1	3.2	2.5	3.9	2.0
15	2.2	2.4	2.8	3.3	2.9	5.0	3.7	3.0	3.2	3.4	3.6	2.0
16	2.2	2.4	2.8	3.3	2.9	4.9	3.6	2.9	3.1	3.8	3.0	2.0
17	2.5	2.4	3.0	3.3	3.0	5.9	3.4	2.8	3.0	3.2	2.8	1.9
18	2.6	2.4	3.0	3.1	3.3	5.8	3.3	2.8	2.8	2.9	2.6	1.9
19	3.4	2.4	3.0	3.0	3.8	4.8	3.3	2.8	2.8	2.7	2.4	1.9
20	3.8	2.4	3.0	2.9	3.5	4.4	3.4	2.7	2.7	2.6	2.3	1.9
21	3.6	2.4	3.0	3.2	3.6	4.8	3.3	2.6	2.6	2.7	2.3	1.9
22	3.2	2.4	3.5	†8.8	3.3	4.8	3.1	2.6	2.6	3.1	2.2	2.0
23	2.9	2.5	4.4	5.6	3.2	4.7	3.0	2.8	2.5	3.0	2.2	2.0
24	2.8	3.4	4.3	4.7	5.6	5.2	3.0	2.7	2.6	2.6	2.4	1.9
25	2.7	3.2	4.1	4.3	4.3	4.7	3.4	2.6	2.6	2.4	2.2	1.9
26	2.6	2.8	4.0	3.6	3.9	4.3	3.4	2.6	2.5	2.4	2.1	‡1.8
27	2.6	2.8	4.6	3.4	5.0	4.1	3.4	2.6	2.4	2.6	2.0	1.8
28	2.5	2.7	6.8	3.4	4.6	4.0	3.2	3.4	2.4	2.4	2.6	1.9
29	2.5	2.9	4.8	3.4	-------	4.4	3.2	4.8	2.6	2.2	2.0	2.0
30	2.4	3.2	4.0	5.1	-------	3.7	3.2	4.2	2.5	2.2	2.0	2.0
31	2.4	-------	3.8	4.3	-------	3.6	-------	3.7	-------	2.2	2.2	-------

NOTES—*River frozen December 10 to 27, 1916; January 12 to 21 and February 4 to 23, 1917, inclusive. †Maximum 10.0 feet at 10 a. m. estimated from hydrograph. ‡Minimum 1.82 feet on September 26 and 27, 1917.

Daily Mean Gage Heights, in feet, of Casselman River at Markleton, Somerset County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.97	3.15	2.69	3.39	4.07	5.32	2.62	3.21	3.27	2.51	2.32	2.98
2	1.97	2.99	2.74	3.45	2.40	4.92	2.62	3.19	3.09	2.34	2.08	2.62
3	1.93	2.89	2.61	3.39	3.83	4.52	2.67	3.06	2.91	2.21	1.98	2.38
4	1.99	2.81	2.57	3.97	3.45	4.22	2.80	2.97	2.78	2.15	1.88	2.28
5	1.97	2.75	2.53	3.92	3.05	4.84	2.70	2.91	2.69	2.11	1.84	2.19
6	1.97	2.65	2.49	3.96	2.45	4.74	2.58	2.85	2.61	2.09	1.80	2.14
7	1.95	2.59	2.44	3.97	3.30	4.69	2.57	2.86	2.94	2.05	1.82	2.11
8	1.92	2.54	2.61	3.97	4.37	4.26	2.72	3.56	3.04	2.04	2.25	2.05
9	1.89	2.52	2.71	3.97	5.17	4.32	3.87	5.43	2.79	2.03	2.29	2.00
10	1.87	2.50	2.77	3.99	4.43	5.19	3.57	3.29	2.57	2.05	3.35	1.92
11	1.87	2.50	2.45	3.89	4.55	4.44	3.60	3.43	2.51	2.04	3.20	1.87
12	1.99	2.45	2.54	3.87	5.10	4.34	3.54	3.21	2.63	2.90	2.62	2.00
13	1.97	2.44	2.67	3.87	7.50	4.54	3.60	3.29	2.51	2.50	2.48	2.25
14	2.01	2.40	2.71	3.99	5.65	5.89	4.30	3.61	2.40	2.41	2.40	2.10
15	1.98	2.39	2.74	4.05	6.25	5.22	5.62	3.36	2.39	2.26	2.58	2.00
16	1.96	2.36	2.74	4.07	5.15	4.44	6.22	3.19	2.31	2.12	2.22	1.96
17	1.91	2.35	2.74	4.15	4.48	4.09	6.22	3.09	2.47	2.04	2.12	2.23
18	1.87	2.32	2.74	4.17	3.85	3.89	5.92	2.99	2.44	2.00	2.06	2.32
19	2.85	2.30	2.75	4.05	4.53	3.69	5.07	2.93	2.34	2.02	2.03	2.38
20	2.59	2.30	2.78	3.97	8.60	3.52	4.44	3.21	2.25	2.08	2.00	2.41
21	2.39	2.34	2.79	3.87	5.53	3.39	5.07	3.31	2.24	2.02	2.00	2.32
22	2.33	2.35	2.94	4.09	4.53	3.32	4.82	4.49	2.67	1.98	1.94	2.24
23	2.29	2.36	3.89	4.15	4.23	3.22	4.34	3.91	2.71	1.92	1.89	2.18
24	2.79	2.32	3.89	4.15	4.13	3.12	4.00	3.63	2.51	1.88	1.86	2.11
25	3.32	*2.32	4.07	4.19	4.47	3.02	3.57	3.61	2.35	1.88	1.82	2.06
26	3.39	2.32	3.91	4.17	†8.50	2.96	3.72	3.79	2.29	1.89	1.80	2.03
27	4.09	2.30	3.64	4.49	5.50	2.86	3.47	3.41	2.28	1.85	1.81	1.98
28	4.57	2.36	3.51	4.49	4.90	2.82	3.34	3.21	2.27	1.84	1.84	2.00
29	3.75	2.40	3.41	4.37	-------	2.78	3.22	3.09	3.11	‡1.77	1.95	1.99
30	3.49	2.50	3.29	4.27	-------	2.73	3.24	3.61	2.77	2.78	2.08	2.00
31	3.35	-------	3.29	4.17	-------	2.66	-------	3.71	-------	2.52	2.75	-------

NOTES—*Gage heights affected by ice November 25, 1917 to February 11, 1918. †Maximum 9.7 feet from hydrograph at 5 a. m. ‡Minimum 1.75 feet.

OHIO BASIN—STATION NO. 25

LAUREL HILL CREEK AT URSINA

DESCRIPTION OF STATION

Location.—At two span, steel, through truss, highway bridge at Ursina, Somerset County.

Records Available.—Discharge measurements and gage heights from August 12, 1913, to September 30, 1918. For other records on this creek see Laurel Hill Creek at Confluence in the 1911 to 1913 reports of the Water Supply Commission.

Drainage Area.—122 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the bridge and is read twice daily by Miss Lizzie R. Case.

Channel.—Both banks are high and not subject to overflow, and the bed is composed of gravel and stones..

Discharge Measurements of Laurel Hill Creek at Ursina, Somerset County
(Drainage area, 122 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec. ft.	
7	April 13	Reckord	244	2.98	537	0.6 method
8	June 27	Wilson	98	1.98	60	Surface & 0.6 method
	1918					
9	Feb. 3	Wilson	59	2.90	40	Under ice cover
10	July 10	Landis	76	1.84	27	Wading measurement

Daily Mean Gage Heights, in feet, of Laurel Hill Creek at Ursina, Somerset County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.88	1.97	2.36	2.85	3.54	2.33	2.42	2.12	2.61	1.90	1.70	1.80
2	1.78	1.97	2.36	2.70	3.39	2.23	2.42	2.12	2.86	1.90	1.75	1.60
3	1.78	1.97	2.36	2.95	2.84	2.13	2.42	2.17	2.76	1.90	1.80	1.76
4	1.78	2.07	2.21	3.25	2.64	2.13	2.52	2.22	2.51	1.90	1.80	1.60
5	1.83	2.07	2.16	3.85	2.39	2.33	2.72	2.32	2.51	1.90	1.70	1.50
6	1.88	1.97	2.11	4.15	2.34	2.43	2.72	2.27	2.31	1.90	1.60	1.80
7	1.78	2.07	2.06	3.45	2.34	2.68	3.17	2.22	6.56	1.80	1.65	1.80
8	1.78	2.07	2.06	3.75	2.34	3.08	3.27	2.32	5.36	2.00	1.85	2.25
9	1.83	2.22	2.06	3.75	*2.34	2.78	3.27	2.42	3.36	2.00	1.95	2.15
10	1.78	2.07	2.06	3.65	2.64	2.73	3.02	2.87	2.91	2.00	1.90	2.00
11	1.78	2.07	2.06	2.70	3.44	3.33	3.02	2.57	2.81	2.25	1.90	2.05
12	1.78	2.17	2.06	2.55	2.49	5.38	3.02	2.37	2.56	1.90	1.70	1.80
13	1.88	2.22	2.06	2.25	2.44	3.83	3.02	2.22	2.51	1.95	1.70	1.70
14	1.83	2.17	*2.25	2.55	2.69	3.38	2.77	2.27	2.41	2.40	3.20	1.70
15	1.78	2.17	2.26	2.55	2.54	3.28	2.47	2.22	2.26	2.50	2.75	1.55
16	2.03	2.17	2.26	2.75	2.44	3.23	2.37	2.22	2.11	2.50	2.70	1.50
17	2.13	2.07	2.16	2.55	2.44	3.73	2.32	2.02	2.01	2.50	1.85	1.60
18	2.13	2.07	2.21	2.35	2.74	3.58	2.52	1.92	2.01	2.30	1.80	1.70
19	2.48	2.07	2.26	2.25	2.84	3.18	2.57	2.02	2.01	2.20	1.75	1.75
20	2.68	1.97	2.36	2.25	2.99	3.03	2.12	1.97	1.96	1.90	1.70	1.60
21	2.38	1.97	2.41	2.65	3.19	3.08	2.07	1.92	1.91	2.10	1.50	1.70
22	2.28	2.07	2.71	†7.20	2.94	2.88	2.02	2.12	1.91	2.10	‡1.30	1.60
23	2.13	2.27	2.56	4.10	3.09	2.88	2.02	2.02	1.86	2.00	1.70	1.50
24	2.08	2.97	2.56	3.35	3.39	3.53	2.22	1.92	1.71	2.05	1.80	1.50
25	2.08	2.77	2.56	3.00	3.14	2.23	2.42	1.82	2.11	2.10	1.80	1.50
26	1.88	2.97	2.56	2.65	3.49	2.73	2.52	1.82	1.91	2.10	1.80	1.56
27	1.88	2.47	4.69	2.45	3.59	2.83	2.42	1.92	1.96	2.20	1.80	1.60
28	1.88	2.47	5.11	2.45	2.64	2.63	2.22	2.27	2.00	2.10	1.80	1.70
29	1.88	2.42	3.91	2.50	-------	2.63	2.12	2.57	2.00	1.90	1.80	1.70
30	1.78	2.42	3.36	3.25	-------	2.53	2.12	2.57	2.00	1.85	1.80	1.70
31	1.78	-------	3.11	3.25	-------	2.43	-------	2.52	-------	1.85	1.85	-------

NOTES—*Creek frozen December 14 to 27, 1916, and February 9 to 23, 1917 inclusive. †Maximum 8.2 feet at 11 a. m. estimated from hydrograph. ‡Minimum 1.20 feet at 8 a. m.

Daily Mean Gage Heights, in feet, of Laurel Hill Creek at Ursina, Somerset County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	‡1.40	2.45	2.25	2.70	2.40	3.75	2.01	2.31	2.71	2.21	1.86	3.41
2	1.50	††2.4	2.05	2.70	2.35	3.60	1.81	2.21	2.51	2.06	1.71	2.81
3	‡1.50	††2.4	2.00	2.70	2.90	3.30	2.21	2.21	2.51	1.91	1.71	2.11
4	1.60	††2.3	2.00	2.70	2.40	3.35	2.06	2.31	2.41	1.91	1.71	2.11
5	1.75	††2.3	2.00	2.70	2.40	3.15	1.86	2.21	2.16	1.91	1.61	2.11
6	1.80	††2.2	*2.10	2.70	2.60	3.45	2.01	2.21	2.21	1.81	1.61	2.06
7	1.60	2.20	1.90	2.55	3.00	3.15	2.16	2.31	2.46	1.81	1.61	1.91
8	1.70	2.15	1.90	2.60	3.30	2.90	2.41	2.41	2.31	1.81	1.81	1.71
9	1.60	2.10	2.00	2.40	3.80	3.70	2.76	2.41	2.16	1.81	1.91	1.71
10	1.70	2.00	2.05	2.40	4.85	3.70	2.86	2.41	2.11	1.84	2.01	1.61
11	1.50	2.85	2.30	2.40	4.95	3.30	2.91	2.51	2.11	1.81	2.21	1.61
12	1.90	2.30	2.40	2.40	6.05	3.35	2.91	2.46	2.11	1.81	2.01	1.71
13	1.80	1.80	2.50	2.40	5.50	3.50	2.91	2.41	2.01	1.86	1.91	2.21
14	1.70	1.80	2.50	2.50	4.30	3.75	3.31	2.61	1.96	1.81	2.36	1.91
15	1.90	1.80	2.55	2.60	4.90	3.40	3.86	‖2.51	1.91	1.71	2.31	1.81
16	1.55	2.10	2.60	2.60	3.80	2.95	4.06	2.41	1.91	1.71	1.91	1.91
17	1.50	2.00	2.60	2.60	3.10	2.70	3.81	2.31	2.01	1.71	2.01	2.11
18	1.50	2.00	2.60	2.60	4.80	2.60	3.46	2.31	1.96	1.71	1.91	2.21
19	1.95	1.85	2.60	2.60	3.60	2.50	2.91	2.26	1.91	1.81	1.81	2.11
20	2.20	1.80	2.60	2.60	†7.15	2.40	2.91	2.71	2.06	1.76	1.81	1.86
21	2.10	1.80	2.60	2.60	4.00	2.35	2.86	2.91	2.16	1.61	1.76	1.71
22	2.30	2.00	2.60	2.60	3.40	2.30	2.71	3.11	2.21	1.71	1.71	1.66
23	1.75	1.80	2.80	2.60	3.20	2.30	2.61	3.26	2.21	1.71	1.56	1.71
24	2.40	1.80	2.80	2.60	2.80	2.25	2.51	3.01	2.11	1.71	1.71	1.61
25	2.60	1.80	3.25	2.60	3.80	2.20	2.71	3.01	2.06	1.71	1.71	1.81
26	2.75	1.90	2.65	2.60	5.45	2.15	2.41	3.01	2.01	1.61	1.56	1.81
27	3.50	1.90	2.55	2.60	3.80	2.10	2.31	2.86	2.01	1.61	1.76	1.76
28	3.05	2.00	2.55	2.60	3.50	2.10	2.21	2.66	2.01	1.61	1.81	1.71
29	3.20	2.00	2.60	2.60	-------	2.10	2.11	2.81	2.01	1.66	1.81	1.71
30	3.00	2.10	2.65	2.50	-------	2.10	2.11	3.06	1.91	1.81	1.96	1.81
31	3.00	-------	2.70	2.40	-------	2.00	2.11	3.46	-------	1.91	2.86	-------

NOTES—*Gage heights affected by ice December 6, 1917 to February 13, 1918. ††Estimated. ‖Interpolated. †Maximum 8.0 feet from hydrograph at 6 a. m. ‡Minimum 1.40 feet.

OHIO BASIN—STATION NO. 26

YOUGHIOGHENY RIVER AT CONNELLSVILLE

DESCRIPTION OF STATION

Location.—At two span, steel, through truss, highway bridge between Connellsville and New Haven.

Records Available.—Discharge complete from July 22, 1908, to September 30, 1918. For other records on this river see Youghiogheny River at Confluence and Sutersville; also Youghiogheny River at Friendsville, Md., in the 1910-11 Report of the Water Supply Commission.

Drainage Area.—1,320 square miles.

Gage.—A standard chain gage, whose elevation of zero is 860.13 feet above mean sea level, is located on the downstream side of the New Haven span and is read twice daily by C. H. Kluesener.

Channel.—Both banks are high and not subject to overflow and the bed is composed of rocks, gravel and mud.

Discharge Measurements of Youghiogheny River at Connellsville, Fayette County
(Drainage area, 1,320 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq.ft.	Feet	See.-ft.	
26	Apr. 13	Reckord	1,675	4.62	4,794	0.2 & 0.8 method
27	Apr. 15	Reckord	1,417	3.54	2,809	0.2 & 0.8 method
28	June 28	Wilson	805	1.37	459	0.2 & 0.8 method
	1918					
29	July 11	Landis	176	0.98	188	Wading 800 ft. above gage

Daily Mean Gage Heights, in feet, of Youghiogheny River at Connellsville, Fayette County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	2.0	1.32	1.8	3.7	5.4	4.5	3.0	2.7	5.3	1.5	1.12	1.28
2	1.6	1.30	2.2	3.6	5.2	4.1	2.9	2.6	5.2	1.35	1.05	1.20
3	1.35	1.20	2.1	4.3	4.0	3.8	2.8	2.4	4.4	1.20	1.18	1.12
4	1.18	1.30	2.0	5.6	3.4	3.7	2.6	2.3	3.8	1.18	1.10	0.98
5	1.08	2.3	2.0	5.3	3.2	3.3	2.4	2.5	3.4	1.05	1.00	1.00
6	0.95	2.2	2.0	6.8	2.6	3.0	3.8	2.7	4.6	1.00	0.88	1.05
7	0.90	1.8	2.0	5.5	*	3.0	4.0	2.5	9.0	1.02	0.80	2.2
8	0.92	1.6	1.8	4.6	-------	4.8	5.6	2.6	7.0	1.08	0.80	2.6
9	0.90	1.38	1.8	4.1	-------	5.7	4.4	3.0	6.0	1.28	0.95	2.2
10	0.95	1.7	1.8	3.7	-------	4.8	4.0	3.7	4.8	1.7	1.6	1.7
11	0.90	1.9	1.7	3.4	-------	6.4	4.0	3.3	4.4	1.6	1.4	1.4
12	0.90	2.0	1.6	3.3	-------	12.6	4.7	3.1	3.6	1.6	1.12	1.38
13	0.92	1.7	1.6	3.4	-------	9.4	4.5	2.9	3.2	1.5	1.30	1.22
14	1.10	2.0	1.5	3.8	-------	7.2	4.1	2.7	3.0	1.7	2.4	1.12
15	1.02	2.0	1.4	3.5	-------	7.8	3.7	2.6	2.9	3.2	3.3	1.05
16	1.15	1.9	1.35	3.2	-------	6.8	3.3	2.4	2.6	3.8	2.1	0.92
17	2.2	1.8	1.30	3.0	-------	6.6	2.9	2.2	2.4	3.4	1.6	0.90
18	2.7	1.7	1.30	2.9	-------	7.6	2.8	2.2	2.2	2.8	1.4	0.90
19	2.8	1.6	1.25	2.8	-------	6.2	2.7	2.0	2.0	2.3	1.25	0.85
20	4.2	1.5	1.38	*	-------	5.2	2.7	1.9	1.8	2.0	1.05	0.78
21	3.6	1.4	1.8	-------	-------	5.2	2.6	1.8	1.7	2.1	0.92	0.85
22	3.0	1.4	3.0	†14.6	-------	5.2	2.4	1.8	1.6	2.2	0.82	0.88
23	2.6	1.38	3.8	9.0	-------	5.1	2.3	1.8	1.6	2.3	1.15	0.80
24	2.2	2.6	3.3	6.3	-------	5.7	2.2	1.9	1.5	2.1	1.6	0.80
25	2.0	2.9	3.0	5.2	5.6	5.4	2.7	1.9	1.5	1.7	1.25	0.78
26	1.8	2.0	2.6	4.1	4.3	4.8	2.9	1.7	1.5	1.4	1.20	0.75
27	1.7	1.8	4.0	3.5	4.8	4.3	3.0	1.6	1.4	1.7	1.08	‡0.72
28	1.6	1.7	8.6	3.5	5.5	4.2	2.8	4.4	1.38	1.8	0.85	0.95
29	1.5	1.9	7.1	3.4	-------	3.9	2.7	6.6	1.7	1.6	0.78	0.92
30	1.4	1.8	5.6	5.0	-------	3.6	2.6	6.0	1.6	1.4	0.90	0.80
31	1.28	-------	4.5	5.2	-------	3.2	-------	4.8	-------	1.22	1.22	-------

NOTES—*River frozen January 20 and 21, and February 7 to 24, 1917, inclusive. †Maximum 15.2 feet at 1 p. m. ‡Minimum 0.70 feet.

Daily Mean Gage Heights, in feet, of Youghiogheny River at Connellsville, Fayette County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.80	2.4	1.4	1.5	1.36	6.6	1.6	2.8	3.0	1.37	1.6	2.2
2	0.75	2.0	1.6	1.6	1.21	6.0	1.6	2.6	2.9	1.30	1.6	3.1
3	0.75	1.9	1.25	1.5	1.39	5.2	1.8	2.5	2.5	1.10	1.12	3.2
4	0.62	2.1	1.8	1.39	1.36	4.7	2.1	2.5	2.3	1.04	1.02	3.0
5	0.95	2.0	1.7	1.33	*1.31	5.1	2.0	2.4	2.1	1.04	0.94	3.0
6	0.80	1.9	1.6	1.6	1.31	5.3	1.8	2.2	1.8	1.04	0.72	3.1
7	0.80	1.8	1.4	1.9	1.7	5.1	1.8	2.1	2.1	1.10	0.52	3.0
8	0.75	1.7	1.20	1.5	2.4	4.7	1.9	3.2	2.2	1.07	‡0.42	2.9
9	0.72	1.5	1.02	1.31	4.4	4.9	2.9	3.9	2.5	1.02	0.64	2.8
10	0.70	1.5	0.95	1.21	6.5	6.0	4.2	3.9	2.1	0.97	0.77	2.1
11	0.65	1.4	0.90	1.26	6.2	5.4	4.2	3.6	2.0	0.94	1.07	1.37
12	0.82	1.4	0.90	1.5	6.8	4.8	4.5	3.3	2.0	0.92	2.0	1.22
13	1.00	1.4	0.90	*1.6	11.1	5.1	4.3	3.0	1.7	1.12	2.0	1.17
14	0.90	1.32	1.00	1.5	8.4	8.3	6.0	3.2	1.6	1.30	1.9	1.02
15	1.02	1.30	1.10	1.7	10.6	7.4	7.3	3.3	1.4	1.17	2.0	1.02
16	0.92	1.30	1.15	1.6	7.7	6.1	7.2	3.1	1.4	1.04	2.1	1.24
17	0.80	1.22	1.18	1.6	5.6	4.9	8.1	2.9	3.1	1.00	2.6	1.4
18	0.80	1.18	1.20	1.5	4.3	4.3	7.6	2.6	3.0	0.94	2.2	1.5
19	1.4	1.12	1.28	1.5	4.5	3.8	5.8	2.5	2.4	0.80	1.9	1.7
20	2.1	1.10	1.30	1.5	13.4	3.4	4.8	2.5	1.9	0.70	1.6	1.8
21	2.2	1.02	1.38	1.5	9.0	3.2	4.7	2.7	1.6	0.64	1.4	1.9
22	1.9	1.00	1.38	1.4	5.7	3.0	5.3	3.1	1.9	0.62	0.97	1.9
23	1.6	1.08	1.5	1.31	3.2	2.8	4.4	4.0	2.2	0.62	0.84	1.8
24	1.5	1.08	1.9	1.23	5.3	2.6	3.9	3.8	2.1	0.54	0.67	1.4
25	1.8	1.00	3.0	1.31	6.5	2.4	3.6	3.9	1.7	0.60	0.62	1.34
26	3.4	1.00	3.3	1.26	11.5	2.2	3.4	4.1	1.5	0.72	0.72	1.30
27	4.2	0.95	3.4	1.13	8.0	2.1	3.2	4.0	1.34	0.67	0.72	1.22
28	5.0	1.05	3.6	1.09	7.0	1.9	3.0	3.7	1.30	0.67	0.72	1.17
29	4.2	1.12	2.9	1.23	-------	1.7	2.8	3.2	1.22	0.77	0.80	1.07
30	3.4	1.30	1.4	1.21	-------	1.6	2.6	2.8	1.14	0.92	0.94	1.02
31	3.1	-------	1.32	1.4	-------	1.6	-------	3.6	-------	1.32	1.6	-------

NOTES—*Gage heights affected by ice January 13 to 21 and February 5 to 10, 1918, and discharge estimated from climatological data. †Maximum 14.0 feet from hydrograph at noon. ‡Minimum 0.42 foot.

Daily Discharge, in second-feet, of Youghiogheny River at Connellsville, Fayette County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	960	452	790	3,320	6,590	4,770	2,140	1,720	6,370	570	336	428
2	640	440	1,140	3,150	6,160	4,040	2,000	1,590	6,160	470	298	380
3	470	380	1,050	4,400	3,860	3,500	1,860	1,360	4,580	380	369	336
4	369	440	960	7,050	2,810	3,320	1,590	1,250	3,500	360	325	260
5	314	1,250	960	6,370	2,470	2,640	1,360	1,470	2,810	298	270	270
6	245	1,140	960	10,400	1,590	2,140	3,500	1,720	4,960	270	212	298
7	220	790	960	6,820	1,250	2,140	3,860	1,470	17,800	281	180	1,140
8	230	640	790	4,960	1,360	5,350	4,740	1,590	11,000	314	180	1,140
9	220	488	790	4,040	*1,250	7,280	4,580	2,140	8,040	428	245	1,140
10	245	710	790	3,320	960	5,350	3,860	3,320	5,350	710	640	710
11	220	870	710	2,810	710	9,150	3,860	2,640	4,580	640	500	566
12	220	960	640	2,640	570	33,500	5,160	2,300	3,150	640	336	488
13	239	710	640	2,810	440	19,300	4,770	2,000	2,470	570	446	392
14	325	960	570	3,500	380	11,600	4,040	1,720	2,140	710	1,360	336
15	281	960	500	2,980	500	13,500	3,320	1,590	2,000	2,470	2,640	298
16	352	870	470	2,470	440	10,400	2,640	1,360	1,590	3,500	1,050	230
17	1,140	790	440	2,140	380	9,750	2,000	1,140	1,360	2,810	640	220
18	1,720	710	440	2,000	570	12,900	1,860	1,140	1,140	1,860	500	220
19	1,860	640	410	1,860	870	8,580	1,720	960	960	1,250	410	200
20	4,220	570	488	*1,650	1,360	6,160	1,720	870	790	960	298	172
21	3,150	500	790	1,720	1,590	6,160	1,590	790	710	1,050	280	200
22	2,140	500	2,140	†40,000	1,650	6,160	1,360	790	640	1,140	188	212
23	1,590	488	3,500	17,800	1,720	5,950	1,250	790	640	1,250	352	180
24	1,140	1,590	2,640	8,860	6,890	7,280	1,140	870	570	1,050	640	180
25	960	2,000	2,140	6,160	7,050	6,590	1,720	870	570	710	410	172
26	790	960	1,590	4,040	4,400	5,350	2,000	710	570	500	380	160
27	710	790	3,860	2,980	5,350	4,400	2,140	640	500	710	314	‡148
28	640	710	16,300	2,980	6,820	4,220	1,860	4,580	488	790	200	245
29	570	870	11,800	2,810	-------	3,680	1,720	9,750	710	640	179	230
30	500	790	7,050	5,740	-------	3,150	1,590	8,040	640	500	220	180
31	428	-------	4,770	6,160	-------	2,470	-------	5,350	-------	392	392	-------

NOTES—*River frozen January 20 and 21, and February 7 to 24, 1917, inclusive, and discharge estimated from climatological data. †Maximum = 42,400 second-feet. ‡Minimum =140 second-feet. Discharges above 36,800 second-feet are estimated.

Daily Discharge, in second-feet, of Youghiogheny River at Connellsville, Fayette County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	180	1,370	500	570	476	10,100	640	1,870	2,150	482	640	1,150
2	165	960	640	640	386	8,320	640	1,610	2,010	440	640	2,300
3	165	870	410	570	494	6,230	790	1,490	1,490	325	336	2,450
4	126	1,050	790	494	476	5,100	1,050	1,490	1,260	292	281	2,150
5	245	960	710	458	*380	6,000	960	1,370	1,050	292	240	2,150
6	180	870	640	640	352	6,470	790	1,150	790	292	156	2,300
7	180	790	500	870	470	6,000	790	1,050	1,050	325	100	2,150
8	165	710	389	570	960	5,100	870	2,450	1,150	308	‡79	2,010
9	156	570	281	446	2,450	5,540	2,010	3,570	1,490	281	132	1,870
10	150	570	245	386	5,540	8,320	4,100	3,570	1,050	255	171	1,050
11	135	500	220	416	8,900	6,720	4,100	3,070	960	240	368	482
12	188	500	220	570	10,800	5,320	4,680	2,600	960	230	960	392
13	270	500	220	*570	26,200	6,000	4,290	2,150	720	336	960	364
14	220	452	270	535	16,200	15,900	8,320	2,450	640	440	870	281
15	281	440	325	570	24,300	12,800	12,400	2,600	500	364	960	281
16	230	440	352	570	13,800	8,610	12,100	2,300	500	292	1,050	404
17	180	392	369	535	7,230	5,540	15,200	2,010	2,300	270	1,610	500
18	180	369	380	535	4,290	4,290	13,400	1,610	2,150	240	1,150	570
19	500	336	428	500	4,680	3,400	7,770	1,490	1,370	180	870	710
20	1,050	325	440	500	†35,000	2,750	5,320	1,490	870	150	640	790
21	1,150	281	488	500	18,400	2,450	5,100	1,740	640	132	500	870
22	870	270	488	500	7,500	2,150	6,470	2,300	870	126	253	870
23	640	314	570	446	2,450	1,870	4,480	3,740	1,150	126	196	790
24	570	314	870	398	6,470	1,610	3,570	3,400	1,050	105	141	500
25	790	270	2,150	446	9,810	1,370	3,070	3,570	710	120	126	464
26	2,750	270	2,600	416	27,700	1,150	2,750	3,920	570	156	156	440
27	4,100	245	2,750	342	14,800	1,050	2,450	3,740	464	141	156	392
28	5,770	298	3,070	320	11,400	870	2,150	3,230	440	141	156	364
29	4,100	336	2,010	398	-------	710	1,870	2,450	392	171	180	308
30	2,750	440	500	386	-------	640	1,610	1,870	347	230	240	281
31	2,300	-------	452	500	-------	640	-------	3,070	-------	452	640	-------

NOTES—*Gage heights affected by ice January 13 to 21 and February 5 to 10, 1918, and discharge estimated from climatological data. †Maximum 37,400 second-feet from hydrograph at noon. ‡Minimum 79 second-feet.

Estimated Monthly Discharge of Youghiogheny River at Connellsville, Fayette County
(Drainage area, 1,320 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October,	4,220	220	874	0.66	0.76
November,	2,000	380	799	0.61	0.68
December,	16,300	410	2,280	1.73	1.99
January,	†40,000	-------	5,740	4.35	5.02
February,	7,050	-------	2,500	1.89	1.97
March,	33,500	2,140	7,440	5.64	6.50
April,	5,740	1,140	2,660	1.97	2.20
May,	9,750	640	2,150	1.63	1.88
June,	17,800	488	3,230	2.45	2.73
July,	35,000	270	911	0.69	0.80
August,	2,640	172	475	0.36	0.42
September,	1,590	‡148	384	0.29	0.32
The year,	40,000	148	2,456	1.86	25.27

NOTES—River frozen January 20 and 21, and February 7 to 24, 1917, inclusive, and discharge estimated from climatological data. †Maximum= 42,400 second-feet, January 22, 1917. ‡Minimum=140 second-feet, September 27, 1917. Discharges above 36,800 second-feet are estimated.

Estimated Monthly Discharge of Youghiogheny River at Connellsville, Fayette County
(Drainage area 1,320 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October,	5,770	126	991	0.75	0.86
November,	1,370	245	534	0.40	0.45
December,	3,070	220	783	0.59	0.68
January,	870	320	503	0.38	0.44
February,	35,000		9,350	7.08	7.37
March,	15,900	640	4,940	3.74	4.31
April,	15,200	640	4,460	3.39	3.78
May,	3,920	1,050	2,400	1.82	2.10
June,	2,300	347	1,040	0.79	0.88
July,	482	105	256	0.19	0.22
August,	1,610	79	481	0.36	0.42
September,	2,450	281	988	0.75	0.84
The year,	35,000	79	2,170	1.64	22.35

NOTES—Gage heights affected by ice January 13 to 21, and February 5 to 10, 1918, and discharge estimated from climatological data. Maximum 37,400 second-feet February 20. Minimum 79 second-feet August 8.

OHIO BASIN—STATION NO. 27

YOUGHIOGHENY RIVER AT SUTERSVILLE

DESCRIPTION OF STATION

Location.—At three span, steel, through truss, county highway bridge at lower end of Sutersville, Westmoreland County.

Records Available.—Discharge measurements and gage heights from June 11, 1915, to September 30, 1918. For other records on this river see Youghiogheny River at Confluence and Connellsville; also Youghiogheny River at Friendsville, Md., in the 1910-1911 Report of the Water Supply Commission.

Drainage Area.—1,680 square miles.

Gage.—A standard chain gage, whose elevation of zero is 733.14 feet above mean sea level, is located on the downstream side of the bridge and is read twice daily by Archie W. McGrew.

Channel.—The right bank is low and overflows; the left is high and overflows at extreme stages, and the bed is generally rocky with shifting bars of sand and gravel.

Remarks.—This station is maintained in co-operation with the U. S. Engineer Office in Pittsburgh.

Discharge Measurements of Youghiogheny River at Sutersville, Westmoreland County
(Drainage area, 1,680 square miles)

No	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec. ft.	
4	Jan. 23	Comstock	7,143	15.45	30,128	
5	Jan. 23	Comstock	5,745	12.80	21,180	Surface method
6	Mar. 12	Comstock	7,644	16.35	36,315	0.6 method
7	Mar. 13	Comstock	6,061	13.42	25,165	Surface method
8	April 16	Reckord	1,918	5.20	2,764	Surface method
9	April 18	Reckord	1,744	4.80	2,194	0.2 & 0.8 method
10	July 5	Wilson	971	3.17	520	0.2 & 0.8 method
	1918					0.2 & 0.8 method
11	July 15	Landis	1,004	2.97	434	0.6 method

Daily Mean Gage Heights, in feet, of Youghiogheny River at Sutersville, Westmoreland County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	4.40	3.50	4.55	5.86	7.45	6.55	5.08	4.66	6.60	3.52	3.24	3.06
2	3.85	3.33	4.42	5.64	7.42	6.05	4.94	4.56	6.40	3.41	3.06	3.06
3	3.42	3.28	4.27	5.90	6.90	5.85	4.87	4.48	5.94	3.36	3.42	3.24
4	3.22	3.19	4.17	7.20	*8.10	5.66	4.69	4.41	5.66	3.30	3.34	3.08
5	3.08	3.60	4.10	7.64	7.90	5.45	4.35	4.48	5.30	3.18	3.14	2.95
6	2.98	4.22	4.03	9.12	7.15	5.22	5.08	4.54	5.55	3.12	2.96	3.15
7	2.94	3.98	3.96	8.54	6.85	4.98	6.70	4.51	9.75	3.05	3.07	3.16
8	2.90	3.69	3.79	6.85	7.28	6.50	6.95	4.56	9.85	3.03	3.22	3.85
9	2.90	3.52	3.70	6.40	7.25	7.76	6.55	4.90	7.65	3.08	3.17	4.76
10	2.88	3.90	3.62	6.06	6.90	6.92	6.07	5.50	6.70	3.65	3.10	4.50
11	2.90	4.28	3.72	5.81	5.95	7.78	6.00	5.44	6.05	3.93	3.06	3.92
12	2.95	4.14	3.76	5.22	5.41	15.35	6.12	5.24	6.12	3.72	3.03	3.56
13	3.10	3.88	3.78	4.65	5.30	12.48	6.35	5.00	5.35	3.56	3.00	3.28
14	3.02	3.86	*3.60	5.45	5.30	9.10	6.00	4.76	5.00	3.44	3.58	3.12
15	2.93	4.29	3.08	5.81	5.30	8.92	5.62	4.58	5.35	4.55	5.15	3.08
16	2.96	4.15	2.98	*8.15	5.30	8.58	5.30	4.37	4.65	5.40	4.71	3.01
17	3.25	3.96	3.34	8.60	5.30	7.85	5.27	4.24	4.44	5.70	3.88	2.94
18	4.20	3.78	3.34	8.40	5.30	9.65	4.89	4.12	4.22	5.42	3.57	2.88
19	4.75	3.68	3.40	8.16	5.53	7.98	4.98	3.96	4.10	4.90	3.40	2.84
20	5.82	3.58	3.38	7.70	6.22	6.89	4.95	3.86	4.02	4.60	3.31	2.82
21	5.82	3.50	3.70	7.44	6.31	6.70	4.76	3.78	3.91	4.38	3.06	2.80
22	5.32	3.44	5.40	†17.93	6.46	6.84	4.59	3.67	3.66	4.50	3.38	2.80
23	4.82	3.42	6.50	13.69	6.55	6.61	4.52	3.81	3.54	4.75	3.22	2.77
24	4.40	4.00	5.86	8.38	9.40	7.15	4.44	3.76	3.39	4.35	3.85	2.74
25	4.10	5.48	5.48	7.20	12.30	7.35	4.45	3.68	3.50	3.92	3.56	2.70
26	3.86	5.30	5.15	6.56	6.95	6.65	5.00	3.58	3.50	4.60	3.33	2.70
27	3.76	4.56	5.85	6.20	6.50	6.26	5.06	3.51	4.18	4.50	3.00	2.70
28	3.58	4.41	11.98	5.80	6.80	6.10	4.82	4.40	4.35	4.09	2.94	2.70
29	3.47	4.33	10.15	5.55	-------	5.82	4.71	7.45	4.12	3.78	3.00	‡2.68
30	3.41	4.40	7.50	6.30	-------	5.58	4.64	7.75	3.86	3.56	3.28	2.68
31	3.38	-------	6.80	7.15	-------	5.30	-------	6.65	-------	3.40	3.15	-------

NOTES—*River frozen December 14 to 22, 1916; January 16 to 21 and February 4 to 25, 1917, inclusive. †Maximum 20.50 feet at 8:00 p. m. estimated from hydrograph. ‡Minimum 2.68 feet on September 29 & 30, 1917.

Daily Mean Gage Heights, in feet, of Youghiogheny River at Sutersville, Westmoreland County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.67	5.73	3.31	4.15	3.73	8.32	3.74	4.73	5.87	3.48	2.62	5.75
2	2.66	5.13	3.61	4.15	3.73	8.97	3.67	4.73	5.43	3.42	2.95	5.00
3	2.65	4.79	3.91	4.15	3.73	7.62	3.61	4.59	4.93	3.28	2.59	4.45
4	2.64	4.50	3.97	4.15	3.93	6.27	3.77	4.43	4.83	3.13	2.40	3.90
5	2.65	4.43	3.81	4.15	3.93	6.97	3.96	4.27	4.73	2.98	2.40	3.80
6	2.68	4.26	3.62	4.14	3.93	7.22	4.02	4.21	4.63	2.88	2.40	3.68
7	2.68	3.95	3.50	4.14	4.28	7.07	3.74	4.17	4.49	2.80	2.55	3.55
8	2.69	3.66	3.42	4.12	5.83	6.62	3.49	4.44	4.33	2.76	2.45	3.36
9	2.76	3.47	3.36	4.12	9.48	6.42	4.16	4.94	4.21	2.73	2.40	3.20
10	2.73	3.39	*3.34	4.10	17.73	††7.5	4.61	5.27	4.09	‡2.34	2.85	3.01
11	2.70	3.35	3.34	4.07	19.28	7.67	4.45	5.49	3.85	2.38	4.40	2.94
12	2.69	3.31	3.33	4.00	19.83	6.97	6.46	††5.7	3.69	2.71	4.10	2.96
13	2.93	3.29	3.32	3.95	14.93	6.72	6.27	††5.7	3.53	2.66	3.55	2.91
14	2.99	3.24	3.31	3.94	11.03	8.87	6.61	5.53	3.44	2.63	4.25	3.10
15	2.99	3.21	3.30	3.94	12.23	9.42	8.31	5.32	3.39	2.97	4.16	4.45
16	2.99	3.19	3.27	3.95	9.88	7.87	9.71	5.14	3.34	2.78	3.55	5.85
17	2.93	3.19	3.16	3.93	7.83	6.57	9.76	4.92	4.57	2.69	3.30	5.60
18	2.90	3.18	3.16	3.93	6.78	6.07	8.51	4.64	5.87	2.62	3.01	4.55
19	3.79	3.16	3.16	3.93	6.28	5.60	7.66	4.45	4.37	2.60	2.68	3.85
20	5.34	3.15	3.16	3.92	†14.38	5.40	6.76	4.27	3.82	2.54	2.61	4.30
21	4.79	3.15	3.16	3.92	13.63	5.34	6.51	4.64	3.51	2.46	2.58	4.20
22	4.07	3.13	3.16	3.92	8.53	5.29	7.11	5.21	3.46	2.41	2.56	3.60
23	3.89	3.11	3.16	3.92	6.93	5.25	6.51	5.97	4.02	2.45	2.54	3.40
24	5.19	3.08	3.16	3.90	6.43	4.95	6.03	5.64	3.78	2.59	2.53	3.34
25	5.59	3.06	3.66	3.90	6.93	4.54	5.66	5.33	3.60	2.85	2.52	3.27
26	4.84	3.06	5.66	3.90	12.71	4.40	5.37	6.84	3.45	2.90	2.52	3.22
27	5.59	3.05	5.31	3.75	11.45	4.30	5.15	6.29	3.29	2.50	2.53	3.15
28	7.07	3.05	5.04	3.75	8.41	4.22	4.99	5.79	3.13	2.41	2.58	3.11
29	6.74	3.05	4.85	3.75	-------	4.04	4.78	5.31	3.42	2.40	3.80	3.06
30	8.99	3.06	4.51	3.75	-------	3.89	4.56	5.29	3.26	2.50	3.00	3.00
31	7.44	-------	4.21	3.75	-------	3.83	-------	5.91	-------	2.50	4.95	-------

NOTES—*Gage heights affected by ice December 10, 1917 to February 13, 1918. ††Estimated. †Maximum 18.73 feet from hydrograph at 7:00 p. m. ‡Minimum 1.96 feet.

OHIO BASIN—STATION NO. 28

TURTLE CREEK NEAR TRAFFORD

DESCRIPTION OF STATION

Location.—At single span, highway bridge at Blackburn Station, near Trafford, Westmoreland County.

Records Available.—Discharge measurements and gage heights from July 28, to September 30, 1914; discharge measurements from October 1, 1914, to January 21, 1916, and discharge measurements and gage heights from January 22, 1916, to September 30, 1918. For other records on this creek see Turtle Creek at East Pittsburgh

in the 1911 to 1914 reports of the Water Supply Commission, and also under "Miscellaneous Discharge Measurements" in the 1915 report.

Drainage Area.—55 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the downstream side of the bridge and is read twice daily by S. T. Churchfield.

Channel.—Both banks are high and not subject to overflow, and the bed is composed of gravel and hardpan.

Discharge Measurements of Turtle Creek near Trafford, Westmoreland County
(Drainage area, 55 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
6	Mar. 29	Knight	59	1.56	73	0.6 method
7	Apr. 17	Knight	39	1.20	29	0.6 method
8	July 7	Wilson	29	1.05	18	Surface method
	1918					
9	Feb. 19	Wilson & Shade	86	1.89	173	0.6 method
10	July 16	Landis	4.7	0.98	5	0.6 method

Daily Mean Gage Heights, in feet, of Turtle Creek near Trafford, Westmoreland County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.98	1.08	1.08	1.69	1.89	1.90	1.19	0.99	1.68	1.13	0.78	1.48
2	0.98	0.98	1.08	1.59	1.89	1.90	1.19	0.99	1.48	1.08	0.78	1.48
3	0.98	0.98	1.08	1.59	*1.89	1.90	1.19	0.99	1.63	1.08	0.78	1.38
4	0.98	1.08	1.08	1.69	1.89	1.90	1.19	0.99	1.68	1.08	0.78	1.28
5	0.88	1.08	1.18	2.24	1.89	1.90	1.34	1.09	1.98	1.08	‡0.68	1.28
6	0.88	1.08	1.18	1.74	1.89	1.90	1.54	1.09	2.43	0.98	0.68	1.48
7	0.88	1.08	1.18	1.59	1.89	1.90	1.49	1.09	2.33	1.02	0.68	1.58
8	0.88	1.08	1.18	1.49	1.89	1.90	1.39	1.09	2.28	0.98	0.78	1.58
9	0.93	1.08	1.18	1.49	1.89	2.00	1.29	1.09	2.18	0.98	0.93	1.33
10	0.98	1.08	1.08	*1.49	1.89	1.90	1.29	1.09	2.48	1.03	0.98	1.28
11	0.98	1.08	1.08	1.49	1.89	1.95	1.29	1.09	2.63	1.18	0.98	1.28
12	0.98	1.08	1.08	1.49	1.89	2.05	1.29	1.09	2.28	1.08	0.98	1.28
13	1.03	1.08	1.08	1.54	1.89	2.00	1.19	1.09	2.03	1.08	0.98	1.28
14	1.08	1.13	1.08	1.69	1.89	2.05	1.19	0.99	1.98	1.08	2.78	1.28
15	1.08	1.18	*1.08	1.59	1.89	2.15	1.19	0.99	1.98	1.08	2.33	1.28
16	1.08	1.18	1.08	1.59	1.89	2.00	1.19	0.99	1.88	1.68	1.93	1.18
17	1.03	1.18	1.08	1.59	1.89	1.90	1.13	0.99	1.68	1.18	1.73	1.08
18	1.03	1.08	1.08	1.59	1.89	1.90	1.09	0.99	1.33	1.08	1.63	1.08
19	1.13	1.08	1.08	1.59	1.89	1.85	1.19	0.99	1.13	1.08	1.48	1.08
20	1.08	0.98	1.08	1.59	1.89	1.65	1.19	0.99	1.08	1.08	1.48	1.08
21	1.08	0.98	1.13	2.24	1.89	1.55	1.09	0.99	1.08	1.08	2.93	1.08
22	1.08	0.98	1.18	†4.69	1.89	1.40	0.99	0.99	1.08	1.13	2.08	0.98
23	1.08	1.13	1.28	2.89	1.89	1.60	0.99	0.99	1.08	1.13	2.23	0.98
24	1.08	1.18	1.28	2.69	2.34	1.95	0.99	0.99	1.18	0.98	1.93	0.98
25	1.08	1.18	1.18	1.89	2.19	1.65	0.99	0.99	1.08	1.03	1.73	0.98
26	0.98	1.18	1.18	1.89	2.09	1.45	0.99	0.99	1.08	1.08	1.63	0.98
27	0.98	1.18	1.58	1.79	1.99	1.49	1.09	0.99	1.18	1.08	1.58	0.98
28	0.98	1.18	2.03	1.79	1.89	1.40	1.09	0.99	1.18	0.98	1.48	0.98
29	0.98	1.28	1.88	1.84	-------	1.56	1.09	1.09	1.18	0.98	1.48	0.98
30	0.98	1.18	1.78	1.89	-------	1.30	1.09	1.09	1.18	0.88	1.48	0.98
31	0.98	-------	1.78	1.94	-------	1.30	-------	1.09	-------	0.88	1.63	-------

NOTES—*Creek frozen December 15 to 22, 1916; January 10 to 20 and February 3 to 23, 1917, inclusive. †Maximum 4.50 feet at 10 a. m. estimated from hydrograph. ‡Minimum 0.68 feet August 5 to 7, 1917.

Daily Mean Gage Heights, in feet, of Turtle Creek near Trafford, Westmoreland County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.99	2.59	0.99	1.29	2.19	1.49	1.10	1.20	2.15	1.10	1.00	1.35
2	0.99	2.54	0.99	1.29	2.19	1.39	1.10	1.10	1.80	1.10	1.00	1.20
3	0.99	2.39	0.99	1.29	2.19	1.39	1.10	1.10	1.45	1.10	1.00	1.16
4	1.09	2.29	0.99	1.29	2.19	1.39	1.10	1.10	1.20	1.10	0.90	1.10
5	1.09	2.14	0.99	1.29	2.19	1.49	1.00	1.10	1.20	1.10	0.99	1.10
6	1.09	1.99	0.99	1.49	2.19	1.49	1.00	1.10	1.20	1.10	0.80	1.10
7	1.09	1.84	0.99	1.84	2.49	1.49	1.05	1.15	1.10	1.10	0.70	1.10
8	0.99	1.64	0.99	1.99	3.04	1.49	1.25	1.20	1.10	1.10	0.70	1.00
9	0.99	1.44	*1.09	1.99	4.99	1.59	1.30	1.10	1.10	1.00	0.80	1.00
10	0.99	1.24	1.09	1.99	4.14	1.69	1.30	1.10	1.10	1.00	1.10	0.90
11	1.09	1.04	1.09	1.99	†4.04	1.59	1.30	1.10	1.20	1.00	1.10	0.90
12	1.09	0.99	1.09	1.99	3.94	1.49	1.35	1.25	1.10	1.00	1.00	1.15
13	1.09	0.99	1.09	1.99	3.59	1.54	1.40	1.85	1.00	1.00	1.00	1.10
14	1.09	0.99	1.09	1.99	3.09	1.69	1.30	1.80	1.00	1.00	1.00	1.10
15	0.99	0.99	1.09	1.99	2.79	1.69	1.30	1.55	1.00	1.00	1.00	1.00
16	0.99	0.99	1.09	1.99	2.29	1.59	1.35	1.35	1.00	0.99	1.00	1.05
17	0.94	0.84	1.09	2.09	2.09	1.49	1.70	1.20	3.30	1.00	1.00	2.20
18	0.94	0.74	1.09	2.19	1.84	1.39	1.65	1.20	2.60	1.00	1.00	2.00
19	3.11	‡0.69	1.09	2.19	1.76	1.39	1.50	1.10	2.00	1.00	0.90	1.90
20	3.69	‡0.69	1.19	2.19	1.79	1.39	1.40	1.10	1.60	1.00	0.90	1.90
21	2.84	‡0.69	1.24	2.19	1.59	1.29	1.40	1.10	1.20	1.00	0.90	1.80
22	2.79	0.69	1.29	2.19	1.39	1.29	1.30	1.20	1.20	1.00	0.80	1.70
23	2.79	0.84	1.29	2.19	1.39	1.29	1.30	1.40	1.20	1.00	0.90	1.60
24	3.04	0.89	1.29	2.19	1.39	1.29	1.20	1.25	1.10	1.00	1.00	1.50
25	3.19	0.89	1.29	2.19	1.59	1.29	1.20	1.50	1.10	1.00	1.00	1.40
26	2.94	0.99	1.29	2.19	1.64	1.29	1.20	2.00	1.10	1.00	1.00	1.30
27	2.89	0.99	1.29	2.19	1.59	1.14	1.20	1.65	1.10	1.00	1.00	1.30
28	2.89	0.99	1.29	2.19	1.49	1.09	1.20	1.45	1.10	1.00	1.05	1.30
29	2.94	0.99	1.29	2.19	-------	1.09	1.20	2.40	1.10	0.90	1.10	1.20
30	2.89	1.04	1.29	2.19	-------	1.09	1.20	3.10	1.10	0.95	1.20	1.20
31	2.74	-------	1.29	2.19	-------	1.09	-------	2.80	-------	1.00	1.45	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 9, 1918. †Maximum 4.2 feet from hydrograph at 8 p. m. ‡Minimum 0.69 foot.

OHIO BASIN—STATION NO. 29

BRUSH CREEK NEAR TRAFFORD

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge between Cavettsville and Trafford, Westmoreland County.

Records Available.—Discharge measurements and gage heights from July 14, 1914, to February 9, 1918.

Drainage Area.—56 square miles.

Gage.—A standard chain gage, whose elevation of zero was arbitrary, was located on the downstream side of the bridge and was read twice daily by Miss Estella Coffey.

Channel.—Both banks overflow at gage height 8 feet, and the bed is composed of gravel and hardpan.

Discharge Measurements of Brush Creek near Trafford, Westmoreland County
(Drainage area, 56 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1916		Sq. ft.	Feet	Sec.-ft.	
7	Oct. 2	Wilson	30	1.81	6	Surface method
	1917					
8	Mar. 29	Knight	62	2.46	80	0.2 & 0.8 method
9	Apr. 17	Knight	53	2.24	40	0.6 method
10	July 7	Wilson	39	2.06	25	0.6 method
	1918					
11	July 15	Landis	22	2.00	16	Measurement taken 200 feet below gage

Daily Mean Gage Heights, in feet, of Brush Creek near Trafford City, Westmoreland County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	-------	1.94	2.06	2.32	3.04	2.43	-------	2.20	2.32	2.18	2.03	2.03
2	‡1.81	1.88	2.06	2.25	2.95	2.42	-------	2.17	2.12	2.32	2.04	1.98
3	-------	1.88	2.04	3.02	*	2.43	-------	2.14	2.12	2.16	2.03	1.96
4	-------	1.98	2.04	3.40	-------	2.36	2.50	2.15	2.58	2.15	2.03	1.98
5	-------	2.00	2.03	3.22	-------	2.33	2.57	2.28	2.48	2.12	2.00	1.96
6	-------	1.93	2.00	3.04	-------	2.34	2.85	2.25	†3.10	2.44	2.00	2.12
7	-------	1.90	1.93	2.76	-------	2.36	2.98	2.22	3.44	2.06	2.00	2.03
8	-------	1.90	1.90	2.66	-------	2.90	2.90	2.21	2.70	2.10	2.03	2.53
9	-------	1.90	1.92	2.50	4.59	3.02	2.88	2.27	2.90	2.10	2.13	2.20
10	-------	1.92	1.94	2.48	4.09	3.26	2.73	2.23	3.43	2.26	2.03	2.13
11	1.82	1.98	1.94	2.42	4.08	3.90	2.63	2.22	2.90	2.27	1.99	2.04
12	1.82	1.95	1.94	2.44	4.04	3.96	2.48	2.19	2.76	2.14	1.98	1.96
13	1.92	1.92	1.94	2.52	4.04	3.40	2.39	2.16	2.53	2.15	1.98	1.99
14	1.86	2.02	*	2.60	4.04	3.02	2.36	2.15	2.44	2.16	3.06	1.96
15	1.82	2.00	-------	3.16	4.04	2.68	2.36	2.10	2.36	2.12	2.28	1.96
16	1.84	1.98	-------	*3.18	4.04	2.58	2.31	2.11	2.32	2.43	2.08	1.98
17	1.85	1.95	-------	-------	4.01	2.58	2.27	2.10	2.28	2.48	1.98	1.96
18	1.85	1.95	-------	-------	3.89	2.60	2.29	2.09	2.19	2.50	2.00	1.98
19	2.35	1.94	-------	-------	3.77	2.58	2.31	2.09	2.18	2.36	1.98	1.96
20	2.08	1.93	-------	-------	2.27	2.53	2.30	2.34	2.16	2.28	1.98	2.12
21	2.00	1.92	-------	-------	2.24	2.48	2.31	2.64	2.16	2.20	1.98	2.03
22	1.96	1.91	-------	5.12	2.23	2.48	2.30	2.49	2.14	3.22	2.13	2.53
23	1.92	1.95	-------	3.04	2.35	2.54	2.27	2.09	2.12	2.44	2.03	2.20
24	1.89	2.06	2.26	2.73	2.41	2.90	2.23	2.89	2.36	2.27	1.98	1.96
25	1.88	2.05	2.19	2.62	2.35	2.66	2.20	2.59	2.15	2.19	2.00	1.97
26	1.88	2.04	2.18	2.52	2.37	2.56	2.26	2.24	2.12	2.23	1.98	1.97
27	1.88	2.02	3.06	2.50	2.39	2.56	2.23	2.44	2.48	2.40	1.98	1.96
28	1.86	2.00	3.15	2.48	2.50	2.54	2.19	2.57	2.18	2.26	2.00	1.97
29	1.85	2.09	2.70	2.75	-------	2.48	2.19	2.19	2.44	2.18	1.96	1.93
30	1.85	2.09	2.56	2.90	-------	-------	2.21	2.11	2.30	2.12	2.08	-------
31	1.85	-------	2.51	2.74	-------	-------	-------	2.29	-------	2.06	2.06	-------

NOTES—*Creek frozen December 14 to 23, 1916; January 16 to 22, and February 3 to 19, 1917 inclusive. †Maximum 5.00 feet at 10 p. m. estimated from hydrograph. ‡Minimum 1.81 feet.

Daily Mean Gage Heights, in feet, of Brush Creek near Trafford City, Westmoreland County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.92	2.18	2.12	3.10	3.38							
2	1.94	2.16	2.12	2.98	3.39							
3	1.94	2.16	2.12	3.11	3.39							
4	1.98	2.13	2.14	2.98	3.39							
5	1.92	2.06	2.11	2.97	3.42							
6	1.97	2.08	2.13	2.94	3.42							
7	1.93	2.11	2.10	2.94	2.88							
8	1.92	2.17	*2.10	2.92	4.48							
9	1.97	2.18	2.09	2.88	5.76							
10	1.98	2.22	2.20	2.85	**							
11	1.94	2.20	2.30	2.87								
12	2.20	2.20	2.28	2.88								
13	1.98	2.22	2.38	2.87								
14	1.97	2.20	2.60	3.12								
15	1.97	2.21	2.58	3.13								
16	1.98	2.22	2.51	3.10								
17	1.94	2.20	2.38	3.45								
18	2.06	2.21	2.51	3.68								
19	3.23	2.18	2.65	3.36								
20	2.26	2.13	2.68	3.34								
21	1.98	2.16	2.78	3.32								
22	2.36	2.20	2.77	3.36								
23	2.39	2.11	2.38	3.36								
24	3.36	2.09	2.50	3.36								
25	3.43	2.10	2.86	3.36								
26	3.17	2.10	2.78	3.36								
27	2.72	2.10	2.82	3.36								
28	2.28	2.09	2.74	3.36								
29	2.23	2.12	2.76	3.36								
30	2.20	2.10	2.91	3.38								
31	2.16		2.96	3.38								

NOTES—*Gage heights affected by ice December 8, 1917 to February 9, 1918. **Bridge washed out.

OHIO BASIN—STATION NO. 30

CHARTIERS CREEK AT CARNEGIE

DESCRIPTION OF STATION

Location.—At two single span, steel, through truss, railroad bridges of the P. C. C. & St. L. Railroad, Chartiers Branch, known as Bridge No. 1 and Freight House Bridge, Carnegie, Allegheny County.

Records Available.—Discharge measurements and gage heights from June 5, 1915, to September 30, 1918.

Drainage Area.—260 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the upstream side of the Freight House bridge and is read twice daily by Richard Musiol.

Channel.—Both banks are high and not subject to overflow, and the bed is soft and sewage covered in pools, but at the riffles is rocky and slag covered.

Remarks.—This station is maintained in co-operation with the U. S. Engineer Office in Pittsburgh.

Discharge Measurements of Chartiers Creek at Carnegie, Allegheny County
(Drainage area, 260 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
4	April 12	Reckord	152	2.65	262	0.2 & 0.8 method
5	April 18	Reckord	126	2.24	165	0.6 method
6	July 3	Wilson	77	1.86	87	0.6 method
	1918					
7	July 17	Landis	34	1.29	34	Surface method

Daily Mean Gage Heights, in feet, of Chartiers Creek at Carnegie, Allegheny County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.39	1.41	1.91	2.53	4.57	2.70	2.59	2.09	2.84	1.80	1.46	2.66
2	1.32	1.36	1.85	1.99	3.45	2.52	2.61	1.99	2.14	2.32	1.44	1.78
3	1.28	1.35	1.61	3.26	*2.39	2.48	2.45	1.94	2.04	1.86	1.38	3.92
4	1.26	1.60	1.68	3.25	2.77	2.31	2.39	1.94	1.81	1.62	1.36	2.32
5	1.22	2.32	1.71	6.15	4.15	2.14	2.60	2.38	1.73	1.59	1.34	1.94
6	1.24	1.72	1.71	5.42	3.42	2.34	3.62	2.13	3.36	1.54	1.36	2.22
7	‡1.21	1.59	1.61	3.89	3.27	2.44	3.81	2.05	3.36	1.49	1.68	2.10
8	1.20	1.53	1.59	3.35	2.97	4.72	3.18	1.97	2.61	1.50	1.66	2.70
9	1.22	1.51	1.68	3.17	2.69	4.33	2.97	1.99	2.38	1.54	1.66	2.19
10	1.24	1.61	1.58	3.10	2.28	3.90	2.85	1.94	2.24	2.26	1.52	1.93
11	1.29	1.75	1.55	2.86	2.24	6.52	2.72	1.85	2.32	1.88	1.38	1.81
12	1.28	1.64	1.61	*2.21	2.13	5.76	2.64	1.85	2.12	1.64	1.36	1.74
13	1.29	1.56	1.57	2.64	2.04	4.26	2.55	1.81	1.96	1.56	1.36	1.70
14	1.32	1.74	*1.54	2.67	2.04	5.31	2.47	1.75	1.86	1.72	2.68	1.66
15	1.27	1.95	1.57	2.41	2.11	4.87	2.38	1.74	1.82	1.73	2.54	1.58
16	1.32	1.75	1.70	2.47	2.07	3.98	2.31	1.70	1.80	1.62	1.92	1.54
17	1.32	1.72	1.50	2.47	2.07	3.82	2.25	1.69	1.74	2.61	1.62	1.51
18	1.28	1.67	1.51	2.50	2.55	3.58	2.24	1.69	1.70	2.81	1.55	1.47
19	2.80	1.57	1.43	2.42	2.39	3.34	2.39	1.69	1.64	2.38	1.56	1.50
20	2.57	1.55	1.47	2.17	2.60	3.18	2 25	1.65	1.60	2.04	1.37	1.55
21	2.22	1.49	1.58	2.39	2.25	3.14	2.19	1.64	1.57	1.84	1.37	1.48
22	1.78	1.47	3.69	†10.79	2.15	3.08	2.11	1.63	1.54	1.78	1.81	1.43
23	1.66	1.61	3.11	4.55	2.35	3.12	2.04	1.69	1.56	2.61	2.89	1.40
24	1.57	2.25	2.55	3.72	4.86	4.70	2.05	1.69	2.70	1.98	2.10	1.37
25	1.52	1.95	2.56	3.35	3.02	3.74	2.11	1.60	1.73	1.82	1.78	1.37
26	1.46	1.67	2.07	3.00	2.81	3.40	2.63	1.56	1.58	1.68	1.62	1.36
27	1.43	1.71	4.23	2.65	3.30	3.18	2.31	1.63	2.42	1.78	1.50	1.38
28	1.42	1.75	5.27	2.96	2.99	3.04	2.14	1.70	2.08	1.70	1.44	1.41
29	1.38	1.93	3.66	2.98	-------	2.96	2.04	2.18	2.68	1.62	1.42	1.40
30	1.38	1.96	2.93	3.99	-------	2.80	2.03	1.81	2.10	1.54	2.34	1.36
31	1.38	-------	2.61	3.57	-------	2.72	-------	1.65	-------	1.48	2.42	-------

NOTES—*Creek frozen December 14 to 21, 1916, January 12 to 22 and February 3 to 19, 1917 inclusive. †Maximum 12.0 feet at noon estimated from hydrograph. ‡Minimum 1.19 feet on October 7, 8, and 9, 1916.

Daily Mean Gage Heights, in feet, of Chartiers Creek at Carnegie, Allegheny County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.36	2.94	1.76	1.86	1.55	3.46	2.03	2.11	2.65	1.56	1.49	2.60
2	1.37	2.66	1.71	1.97	1.48	3.38	2.04	2.02	2.46	1.44	1.40	1.91
3	1.36	2.50	1.64	1.97	1.50	3.16	2.01	1.99	2.27	1.48	1.38	1.73
4	1.41	2.37	1.64	1.89	1.84	3.00	2.02	1.99	2.17	1.44	1.33	1.61
5	1.54	2.26	1.61	1.73	2.72	3.51	1.94	1.95	2.09	1.40	1.34	1.62
6	1.47	2.22	1.61	1.73	1.54	3.36	1.88	1.89	2.08	1.39	1.32	1.52
7	1.38	2.15	1.62	1.78	2.22	3.18	1.93	1.95	2.22	1.36	1.31	1.37
8	1.36	2.06	1.62	1.93	4.56	3.00	2.19	2.11	2.02	1.40	1.51	1.35
9	1.36	2.04	*1.72	1.99	8.28	2.06	2.47	1.94	1.95	1.39	1.40	1.30
10	1.38	2.02	1.72	1.75	5.87	4.26	2.29	1.91	1.88	1.37	1.42	1.27
11	1.39	1.98	1.72	1.67	5.43	3.40	2.72	1.90	2.06	1.40	2.14	1.24
12	1.66	1.96	1.72	1.70	5.60	3.26	3.83	2.21	2.01	1.58	2.06	1.58
13	1.82	1.93	1.72	3.04	5.96	3.14	3.95	2.27	1.84	2.06	1.78	2.05
14	1.52	1.86	1.72	3.04	4.06	4.11	3.51	3.01	1.75	1.50	1.73	1.62
15	1.52	1.86	1.52	1.71	5.18	3.58	2.97	2.37	1.74	1.40	1.76	1.40
16	1.56	1.86	1.47	1.65	3.67	3.16	2.77	2.19	1.71	1.36	1.48	1.68
17	1.42	1.85	1.48	1.71	3.20	3.02	2.79	2.07	2.24	1.34	1.40	2.80
18	1.37	1.79	1.47	1.70	2.72	2.85	2.67	1.99	1.86	1.34	1.37	2.27
19	2.74	1.76	1.48	1.79	4.28	2.74	2.49	1.95	1.70	1.30	1.32	2.01
20	3.20	1.76	1.53	1.85	7.06	2.64	2.40	1.89	1.62	1.27	1.30	2.10
21	2.36	1.76	2.12	1.96	3.73	2.56	2.43	1.97	1.62	‡1.20	1.26	2.01
22	2.06	1.76	2.49	1.67	3.26	2.50	2.39	2.06	1.68	1.30	1.28	1.74
23	1.94	1.76	2.20	1.58	3.04	2.42	2.29	2.59	1.68	1.33	1.90	1.66
24	2.16	1.76	2.27	1.51	3.08	3.36	2.27	2.25	1.64	1.78	1.45	1.60
25	4.00	1.66	2.62	1.51	2.35	2.83	2.17	2.74	1.60	2.30	1.32	1.55
26	3.36	1.62	*2.19	1.53	†6.23	2.23	2.09	4.95	1.59	1.68	1.30	1.51
27	2.80	1.46	1.89	1.50	3.88	2.18	2.17	2.94	1.59	1.50	1.32	1.47
28	3.41	1.71	2.05	1.57	3.48	2.14	2.13	2.55	1.57	1.40	1.36	1.46
29	2.95	1.73	1.91	1.47	-------	2.10	2.17	2.62	1.52	1.35	1.46	1.41
30	3.98	1.74	1.82	1.55	-------	2.05	2.17	3.67	1.48	2.16	1.96	1.39
31	3.34	-------	1.86	1.56	-------	2.03	-------	3.16	-------	1.71	3.53	-------

NOTES—*Gage heights affected by ice, December 9, to 17 and December 26, 1917 to February 13, 1918. †Maximum 7.4 feet from hydrograph at 6 a. m. ‡Minimum 1.20 feet.

OHIO BASIN—STATION NO. 31

NESHANNOCK CREEK AT EASTBROOK STATION

DESCRIPTION OF STATION

Location.—At single span, wood and steel, through truss, highway bridge at Eastbrook Station, Lawrence County.

Records Available.—Discharge measurements and gage heights from January 19 to September 30, 1914; discharge measurements from October 1, 1914, to September 30, 1915, and discharge measurements and gage heights from October 1, 1915, to September 30, 1918.

Drainage Area.—235 square miles.

Gage.—A standard chain gage, whose elevation of zero is 877.53 feet above mean sea level, is located on the upstream side of the bridge and is read twice daily by F. C. Reynolds.

Channel.—Both banks are high and not subject to overflow, and the bed is composed of rock and gravel.

Discharge Measurements of Neshannock Creek at Eastbrook Station, Lawrence County
(Drainage area, 235 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
8	May 5	Wilson	189	2.32	432	0.2, 0.6 & 0.8 method
9	May 21	Wilson	103	1.50	116	0.6 method.
10	July 19	Wilson	224	2.76	637	0.2 & 0.8 method.

Daily Mean Gage Heights, in feet, of Neshannock Creek at Eastbrook Station, Lawrence County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.10	1.20	1.70	2.00	3.40	1.90	1.90	1.50	3.00	1.70	1.40	1.30
2	1.00	1.20	1.60	1.90	2.40	1.80	2.00	1.50	2.40	2.50	1.40	1.30
3	1.00	1.20	1.60	2.00	*2.00	1.70	2.00	1.40	2.00	2.20	1.30	1.30
4	1.00	1.10	1.50	2.60	1.90	1.70	1.80	1.50	1.80	1.70	1.30	1.30
5	1.00	1.20	1.60	†4.80	1.80	1.40	1.70	2.40	2.30	1.60	1.30	1.30
6	1.00	1.20	1.50	4.50	1.90	1.50	2.80	2.40	4.60	1.50	1.30	1.50
7	‡1.00	1.20	1.40	3.00	1.80	1.70	††3.00	2.10	4.80	1.50	1.30	2.40
8	1.00	1.10	1.40	2.40	1.60	2.90	2.70	2.10	3.60	1.60	1.30	2.80
9	1.10	1.20	1.40	2.20	1.50	2.60	2.30	1.80	3.40	1.50	1.30	2.40
10	1.10	1.40	1.70	2.20	1.50	2.50	2.00	1.70	3.90	4.20	1.40	1.90
11	1.10	1.40	1.60	2.00	1.60	3.60	1.80	1.60	3.40	2.80	1.30	1.60
12	1.00	1.30	1.50	1.70	1.60	3.90	1.80	1.40	2.70	2.50	1.20	1.50
13	1.20	1.20	1.50	1.80	1.60	2.90	1.80	1.40	2.30	3.00	1.20	1.40
14	1.40	1.30	1.40	1.50	1.70	2.60	1.70	1.40	2.00	2.70	2.00	1.50
15	1.30	1.60	1.60	1.60	1.60	2.50	‖1.60	1.30	1.80	4.40	1.70	1.50
16	1.20	1.50	*1.60	1.80	1.70	2.20	1.60	1.30	1.80	3.50	1.50	‖1.40
17	1.10	1.40	1.60	1.80	1.70	2.20	1.50	1.30	1.80	4.00	1.40	1.30
18	1.00	1.20	1.60	1.90	1.90	2.00	1.50	1.30	1.60	3.40	1.20	1.40
19	1.60	1.20	1.60	2.10	2.20	1.90	1.70	1.40	1.60	2.70	1.20	1.30
20	2.20	1.10	1.60	2.20	3.60	2.10	1.80	1.40	1.60	2.50	1.20	1.30
21	1.80	1.10	1.60	2.10	4.40	2.20	1.60	1.50	1.50	2.10	1.20	1.30
22	1.60	1.20	1.60	2.40	4.00	2.10	††1.70	2.10	1.50	1.90	1.50	1.30
23	1.40	1.20	1.60	3.10	3.60	2.10	1.60	2.40	1.40	2.30	2.70	‖1.30
24	1.30	2.00	1.50	3.30	2.80	2.90	1.40	2.00	2.30	2.10	2.50	1.30
25	1.30	2.10	1.60	3.00	‖2.50	2.30	1.40	1.60	1.70	1.90	1.90	1.20
26	1.20	1.50	1.90	2.90	2.20	2.30	1.50	1.50	1.60	2.00	1.60	1.20
27	1.30	1.50	3.30	3.20	2.40	2.00	1.60	††1.40	2.60	2.20	1.40	1.20
28	1.20	1.40	3.80	2.80	2.20	2.10	1.50	1.70	2.00	1.80	1.30	1.30
29	1.10	1.80	2.90	2.60	-------	2.10	1.30	1.90	3.30	‖1.70	1.30	1.40
30	1.20	1.90	2.50	3.30	-------	2.00	1.40	1.80	3.30	1.60	1.40	1.20
31	1.00	-------	‖2.30	3.20	-------	1.90	-------	1.80	-------	1.60	1.30	-------

NOTES—*Creek frozen December 16 to 27, 1916, and February 3 to 21, 1917, inclusive. †Maximum 6.50 feet at 8:00 p. m. estimated from hydrograph. ‡Minimum 0.90 feet at 5:00 p. m. ††Estimated. ‖Interpolated.

Daily Mean Gage Heights, in feet, of Neshannock Creek at Eastbrook Station, Lawrence County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.30	3.82	2.04	*2.69	1.83	6.00	1.56	1.69	2.72	1.58	1.15	1.19
2	1.29	3.01	2.08	2.52	1.86	3.52	1.52	1.58	2.30	1.51	1.12	1.18
3	1.30	2.44	1.83	2.25	1.89	2.85	1.54	1.67	2.05	1.36	1.12	1.24
4	1.68	2.21	1.68	2.10	1.90	2.42	1.54	1.69	2.80	1.29	1.08	1.33
5	1.68	2.03	1.70	2.08	1.87	2.68	1.55	1.69	2.45	1.28	1.09	1.39
6	1.68	1.86	1.66	2.10	1.86	2.89	1.54	1.58	2.18	1.34	1.03	1.44
7	1.61	1.78	1.64	2.09	1.85	2.78	1.62	1.46	2.10	1.26	0.97	1.40
8	1.57	1.66	1.51	2.06	2.00	2.45	2.43	1.49	2.02	1.16	2.26	1.40
9	1.44	1.64	*1.52	2.06	3.32	2.81	3.05	1.48	1.76	1.15	2.06	1.35
10	1.40	1.63	1.52	2.03	3.46	4.25	2.45	1.56	1.74	1.17	1.54	1.17
11	1.38	1.67	1.58	1.95	3.74	3.00	2.24	1.92	1.68	1.16	1.40	1.18
12	1.47	1.69	1.60	1 92	5.85	2.82	2.45	2.54	1.65	1.38	1.32	1.09
13	1.68	1.62	1.61	1.90	5.15	2.54	2.84	4.04	1.64	1.19	1.16	1.28
14	‖1.64	1.50	1.63	1.88	3.78	5.84	2.60	3.56	1.60	1.13	1.16	1.21
15	1.60	1.52	1.62	1.90	4.60	4.78	2.49	2.54	1.47	1.16	1.08	1.24
16	1.80	1.54	1.62	1.86	3.32	2.89	1.94	2.36	1.44	1.15	1.10	1.38
17	1.52	1.57	1.64	1.84	2.28	2.56	3.05	1.95	1.47	1.12	1.02	1.56
18	1.38	‖1.56	1.66	1.82	2.29	2.34	2.78	1.70	1.42	1.20	1.07	1.51
19	4.10	1.55	1.68	1.84	2.82	2.12	2.42	1.65	1.21	1.14	1.03	1.42
20	4.49	1.54	1.67	1.86	†7.78	2.08	2.29	1.66	1.32	1.12	1.02	1.42
21	2.80	1.52	1.67	1.84	3.52	2.06	2.28	2.40	1.42	1.07	1.01	1.42
22	2.35	1.62	2.58	1.84	2.49	1.87	2.29	1.95	2.28	1.08	0.96	1.40
23	2.18	1.78	2.70	1.84	2.16	1.90	2.30	3.30	1.98	1.13	‡0.91	1.42
24	3.67	1.61	1.85	1.82	2.24	1.86	2.38	2.40	1.56	1.11	0.93	1.38
25	5.81	1.58	2.50	1.81	2.25	1.86	2.38	2.73	1.48	1.21	1.02	1.31
26	4.22	1.51	3.01	1.80	2.34	1.73	2.02	3.94	1.46	1.56	0.96	1.30
27	3.07	1.59	2.86	1.80	2.42	1 64	1.90	3.14	1.46	1.35	0.96	1.30
28	3.10	1.66	2.85	1.80	2.30	1.56	1.99	2.82	1.26	1.32	0.99	1.22
29	3.03	1.76	2.84	1.80	-------	1.57	1.88	2.28	1.22	1.41	1.30	1.13
30	5.16	1.88	2.89	1.79	-------	1.54	1.80	3.28	1.41	1.41	1.46	1.08
31	3.60	-------	2.72	1.78	-------	1.55	-------	3.05	-------	1.34	1.18	-------

NOTES—*Gage heights affected by ice December 9, 1917 to 25; and January 1, to February 16, 1918. ‖Interpolated. †Maximum 8.9 feet from hydrograph at 6:00 a. m. ‡Minimum 0.90 foot.

OHIO BASIN—STATION NO. 32

SLIPPERY ROCK CREEK AT WURTEMBURG

DESCRIPTION OF STATION

Location.—At three span, steel, deck truss, highway bridge crossing Slippery Rock Creek at the north end of Wurtemburg, Lawrence County.

Records Available.—Discharge complete from January 1, 1912, to September 30, 1918.

Drainage Area.—400 square miles.

Gage.—A standard chain gage, whose elevation of zero is 817.63 feet above mean sea level, is located on the upstream side of the bridge and is read twice daily by Jacob H. Boots.

Channel.—Both banks are high and do not overflow, and the bed is composed of gravel.

Discharge Measurements of Slippery Rock Creek at Wurtemburg, Lawrence County.
(Drainage area 400 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
24	May 4	Wilson	184	2.40	170	0.6 method.
25	July 18	Wilson	748	4.77	2,308	Surface method
	1918					
26	Jan. 6	Wilson	195	3.99	91	Under ice cover.

Daily Mean Gage Heights, in feet, of Slippery Rock Creek at Wurtemburg, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	2.05	2.17	3.06	3.21	4.4	3.34	3.02	2.47	3.9	3.20	2.31	2.38
2	2.05	2.14	2.79	3.04	3.9	3.23	2.99	2.48	3.9	3.05	2.23	2.28
3	2.02	2.16	2.65	3.18	3.36	2.96	3.03	2.48	3.40	3.20	2.20	2.24
4	2.07	2.17	2.56	3.8	3.35	2.91	2.90	2.46	3.14	2.74	2.26	2.22
5	2.01	2.19	2.60	†5.0	*3.20	2.75	2.80	3.6	2.94	2.58	2.19	2.16
6	2.02	2.23	2.61	5.9	3.15	2.77	3.6	3.7	5.1	2.48	2.24	3.5
7	2.09	2.21	2.56	4.6	3.06	3.02	4.1	3.31	6.1	2.38	2.15	4.1
8	2.00	2.21	2.43	3.9	2.86	3.7	3.7	3.19	5.3	2.92	2.16	3.8
9	2.05	2.19	2.53	3.5	2.80	4.0	3.35	2.95	4.7	2.96	2.18	3.7
10	‡1.99	2.24	2.83	3.46	2.83	3.7	3.11	2.83	5.5	4.8	2.22	3.10
11	2.13	2.37	2.69	3.26	2.76	4.4	2.99	2.73	4.5	4.5	2.20	2.80
12	2.07	2.35	2.65	2.82	2.70	5.2	2.92	2.67	3.9	3.9	2.18	2.60
13	2.15	2.25	2.70	2.93	2.72	4.5	2.85	2.62	3.38	3.42	2.14	2.51
14	2.26	2.37	*2.52	2.70	2.59	3.9	2.77	2.63	3.12	3.42	2.40	2.14
15	2.23	2.57	2.59	*2.90	2.62	3.9	2.73	2.57	2.98	4.9	2.74	2.40
16	2.19	2.53	2.49	3.00	2.63	3.6	2.69	2.49	2.93	4.1	2.42	2.34
17	2.17	2.42	2.61	2.96	2.74	3.45	2.65	2.45	2.85	4.0	2.25	2.23
18	2.14	2.31	2.59	2.88	2.78	3.6	2.61	2.44	2.72	4.6	2.16	2.20
19	2.43	2.34	2.60	2.88	3.04	3.35	2.78	2.45	2.64	3.6	2.17	2.22
20	3.02	2.27	2.65	2.91	3.6	3.29	2.92	2.48	2.69	3.41	2.10	2.20
21	2.97	2.26	2.63	2.96	3.6	3.27	2.77	2.55	2.60	3.03	2.24	2.21
22	2.72	2.22	2.87	3.8	3.38	3.27	2.71	2.97	2.46	2.84	2.24	2.20
23	2.47	2.27	3.6	4.3	3.35	3.25	2.63	3.7	2.43	2.80	3.6	2.18
24	2.35	2.79	3.8	4.3	4.0	4.5	2.57	3.35	2.76	2.74	4.0	2.12
25	2.24	3.05	3.47	3.8	4.4	4.3	2.55	2.97	2.86	2.63	3.46	2.16
26	2.20	2.72	3.21	3.29	3.6	3.7	2.58	2.81	2.58	2.54	2.83	2.12
27	2.25	2.57	3.7	3.17	3.8	3.43	2.67	2.75	3.19	2.70	2.58	2.10
28	2.16	2.54	4.9	3.02	3.6	3.36	2.53	2.77	3.20	2.60	2.44	2.19
29	2.18	2.86	4.7	3.16	-------	3.34	2.47	3.8	3.45	2.44	2.35	2.22
30	2.09	3.29	4.0	4.7	-------	3.32	2.43	3.7	4.0	2.38	2.32	2.24
31	2.13	-------	3.47	4.4	-------	3.13	-------	3.21	-------	2.34	2.36	-------

NOTE—*Creek frozen December 14 to 27, 1916; January 15 to 30, and February 5 to 25, 1917, inclusive. †Maximum 6.5 feet at 11 P. M. estimated from hydrograph. ‡Minimum 1.96 feet.

Daily Mean Gage Heights, in feet, of Slippery Rock Creek at Wurtemburg, for the period October 1, 1916, to September 30, 1918.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	2.18	4.3	3.06	4.5	3.8	5.4	2.55	2.90	3.6	2.24	2.32	2.53
2	2.24	3.8	3.12	4.5	3.8	4.9	2.57	2.80	3.46	2.38	2.15	2.52
3	2.27	3.44	2.88	4.2	3.7	4.0	2.73	2.72	3.16	2.27	2.04	2.34
4	2.80	3.30	2.77	4.3	3.6	3.6	3.03	2.64	2.93	2.18	2.03	2.22
5	3.24	3.14	2.68	4.2	3.6	3.6	2.90	2.62	3.42	2.16	2.00	2.31
6	2.80	3.01	2.66	4.0	3.7	3.8	2.69	2.59	3.23	2.14	‡2.00	3.07
7	2.65	2.94	2.60	4.7	3.9	3.8	2.61	2.58	3.30	2.13	1.99	2.87
8	2.48	2.87	2.66	4.4	4.2	3.6	3.45	2.62	3.04	2.06	2.34	2.43
9	2.49	2.82	2.42	4.5	5.6	3.6	3.9	2.56	2.81	2.14	2.90	2.33
10	2.52	2.80	*2.88	4.5	6.5	4.5	3.26	2.47	2.69	2.12	2.66	2.25
11	2.40	2.76	2.92	4.4	6.8	4.1	3.38	2.70	2.63	2.10	2.86	2.19
12	2.50	2.72	2.88	4.3	7.6	3.8	3.9	2.82	2.57	2.14	2.67	2.17
13	3.08	2.70	2.88	4.2	9.0	3.6	3.8	3.9	2.53	2.10	2.40	2.43
14	2.91	2.68	2.95	4.0	5.6	5.5	3.6	4.5	2.46	2.04	2.30	2.61
15	2.72	2.69	2.96	3.8	5.8	5.7	3.37	3.6	2.46	2.04	2.16	2.41
16	2.86	2.68	3.02	4.0	5.2	4.3	3.07	3.12	2.38	2.02	2.15	2.33
17	2.93	2.71	3.02	4.2	4.1	3.8	3.8	2.94	2.52	2.06	2.10	2.49
18	3.6	2.67	2.98	4.2	3.7	3.5	4.2	2.82	2.92	2.02	2.04	2.70
19	5.2	2.62	3.08	4.2	3.9	3.35	3.7	2.68	2.54	2.02	2.00	2.55
20	4.7	2.60	3.08	4.0	†7.7	3.15	3.35	2.64	2.36	1.99	2.00	2.47
21	4.2	2.58	3.32	3.8	5.6	3.07	3.17	3.18	2.32	2.02	2.00	2.59
22	3.6	2.66	4.0	3.5	4.1	2.99	3.21	3.00	3.20	2.05	1.98	2.55
23	3.24	2.76	4.6	3.8	3.7	2.91	3.23	3.5	3.39	2.02	2.05	2.37
24	4.0	2.82	4.2	4.0	3.5	2.84	3.42	3.43	2.71	2.14	1.99	2.39
25	6.3	2.68	6.4	4.2	3.5	2.77	3.21	3.00	2.52	2.25	1.99	2.25
26	5.9	2.59	6.5	4.1	4.0	2.69	2.97	4.1	2.42	2.40	2.02	2.27
27	5.1	2.63	6.0	4.0	3.8	2.65	2.92	4.1	2.38	2.42	1.98	2.21
28	4.8	2.59	5.6	4.0	3.45	2.65	2.91	3.5	2.36	2.20	‡1.98	2.14
29	4.4	2.58	5.4	3.8	-------	2.61	3.07	3.17	2.32	2.06	2.48	2.13
30	5.4	2.70	4.8	3.9	-------	2.61	3.14	4.8	2.30	2.56	2.85	2.12
31	5.2	-------	4.9	3.9	-------	2.57	-------	4.6	-------	2.66	2.52	-------

NOTES—*Gage heights affected by iee December 10, 1917 to February 13, 1918. †Maximum 8.3 feet from hydrograph at 6 p. m. ‡Minimum 1.96 feet.

Daily discharge, in second-feet, of Slippery Rock Creek at Wurtemburg, Lawrence County, for the period October 1, 1916, to September 30, .1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	25	44	578	698	1,950	806	546	172	1,350	690	85	120
2	25	38	383	562	1,350	714	523	178	1,350	570	59	74
3	22	42	285	674	824	502	554	178	860	490	50	62
4	27	44	226	1,240	815	467	460	166	642	348	68	56
5	21	48	250	†2,830	*690	355	390	1,040	488	238	48	42
6	23	59	257	4,550	570	369	1,040	1,140	3,000	178	62	950
7	29	53	226	2,220	460	546	1,580	779	5,010	120	40	1,580
8	20	53	148	1,350	390	1,140	1,140	682	3,360	474	42	1,240
9	25	48	208	950	320	1,460	815	495	2,360	502	46	1,140
10	‡19	62	411	914	250	1,140	618	411	3,720	2,510	56	610
11	36	115	313	738	190	1,950	523	341	2,080	2,080	50	390
12	27	105	285	404	160	3,170	474	299	1,350	1,350	46	250
13	40	65	320	481	130	2,080	425	264	842	878	38	196
14	68	115	*160	320	80	1,350	369	271	626	878	130	154
15	59	232	130	*250	65	1,350	341	232	516	2,670	348	130
16	48	208	120	190	56	1,040	313	184	481	1,580	142	100
17	44	142	105	160	50	905	285	160	425	1,460	65	59
18	38	85	105	130	65	1,040	257	154	334	2,220	42	50
19	148	100	90	105	190	815	376	160	278	1,040	44	56
20	546	71	80	80	460	762	474	178	313	869	30	50
21	509	68	90	65	495	746	369	220	250	554	62	53
22	334	56	130	250	530	746	327	509	166	418	62	50
23	172	71	320	390	570	730	271	1,140	148	390	1,040	46
24	105	383	220	250	860	2,080	232	815	362	346	1,460	34
25	62	570	80	160	1,460	1,820	220	509	432	271	914	42
26	50	334	65	80	1,040	1,140	238	397	238	214	411	34
27	65	232	460	50	1,240	887	290	355	682	320	238	30
28	42	214	2,670	130	1,040	824	208	369	690	250	154	48
29	46	432	2,360	390	-------	806	172	1,240	905	154	105	56
30	29	762	1,460	1,240	-------	788	148	1,140	1,460	120	90	62
31	36	-------	923	1,950	-------	634	-------	698	-------	100	110	-------

NOTES—*Creek frozen December 14 to 27, 1916; January 15 to 30 and February 5 to 25, 1917, inclusive, and discharge estimated from climatological data. †Maximum=5,980 second-feet. ‡Minimum=16 second-feet.

Daily discharge, in second-feet of Slippery Rock Creek at Wurtemburg, Lawrence County, for the period October 1, 1916 to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	75	1,700	486	145	95	3,340	202	390	920	92	117	194
2	92	1,110	524	145	95	2,540	212	330	794	138	68	189
3	101	776	578	145	95	1,340	292	286	552	101	43	124
4	330	660	314	127	80	920	468	245	408	75	41	86
5	612	538	265	110	80	920	390	235	758	70	35	114
6	330	456	255	91	95	1,110	270	220	604	65	‡35	492
7	250	414	225	145	127	1,110	230	216	660	62	34	372
8	173	372	255	145	180	920	785	235	474	47	124	156
9	176	342	152	180	302	920	1,220	207	336	65	390	120
10	189	330	*110	180	480	1,960	628	170	270	60	255	95
11	145	308	95	162	920	1,460	724	275	240	55	366	78
12	180	286	95	145	1,800	1,110	1,220	342	212	65	260	72
13	498	275	80	145	2,690	920	1,110	1,220	194	55	145	156
14	396	265	80	145	6,710	3,520	920	1,960	166	43	110	230
15	286	270	80	145	4,100	3,900	716	920	166	43	70	148
16	366	265	80	145	3,000	1,700	492	524	138	39	68	120
17	408	280	80	145	1,460	1,110	1,110	414	189	47	55	176
18	920	260	80	127	1,010	830	1,580	342	402	39	43	275
19	3,000	235	80	127	1,220	700	1,010	165	198	39	35	202
20	2,240	225	80	127	†8,490	545	700	245	131	34	35	170
21	1,580	216	110	110	3,710	492	550	566	117	39	35	220
22	920	255	145	110	1,460	444	588	450	580	45	32	202
23	612	308	202	110	1,010	396	604	800	732	39	45	134
24	1,340	342	145	110	830	354	758	767	280	65	34	142
25	5,120	265	180	110	830	314	588	450	189	95	34	95
26	4,300	220	202	110	1,340	270	432	1,460	152	145	39	101
27	2,840	240	202	110	1,110	250	402	1,460	138	152	32	83
28	2,390	220	180	110	785	250	396	830	131	80	‡32	65
29	1,830	216	180	110	-------	230	492	559	117	47	173	62
30	3,340	275	162	110	-------	230	538	2,390	110	207	360	60
31	3,000	-------	145	110	-------	212	-------	2,100	-------	255	180	-------

NOTES—*Gage heights affected by ice December 10, 1917, to February 13, 1918, and discharge estimated from climatological data. †Maximum 10,100 second-feet from hydrograph at 6 p. m. ‡Minimum 29 second-feet.

Estimated Monthly Discharge of Slippery Rock Creek at Wurtemburg, Lawrence County.
(Drainage area 400 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	546	‡19	88	0.22	0.25
November	570	38	162	0.40	0.45
December	2,670	-------	434	1.08	1.24
January	†4,550	-------	768	1.92	2.21
February	1,950	-------	582	1.46	1.52
March	3,170	355	1,070	2.68	3.09
April	1,580	148	466	1.16	1.29
May	1,140	154	480	1.20	1.38
June	5,010	148	1,160	2.90	3.24
July	2,670	100	790	1.98	2.28
August	1,460	30	198	0.50	0.58
September	1,580	30	259	0.65	0.72
The year	5,010	19	538	1.34	18.25

NOTES—Creek frozen December 14 to 27, 1916; January 15 to 30, and February 5 to 25, 1917, inclusive, and discharge estimated from climatological data. †Maximum=5,980 second-feet, January 5, 1917. ‡Minimum=16 second-feet, October 10, 1916.

Estimated Monthly Discharge of Slippery Rock Creek at Wurtemburg, Lawrence County.
(Drainage area 400 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	5,120	75	1,230	3.08	3.55
November	1,700	216	397	0.99	1.10
December	524	----------	182	0.46	0.53
January	----------	----------	130	0.32	0.37
February	8,490	----------	1,470	3.68	3.83
March	3,900	212	1,110	2.78	3.20
April	1,580	202	655	1.64	1.83
May	2,390	170	674	1.68	1.94
June	920	110	345	0.86	0.96
July	255	††34	78	0.20	0.23
August	390	††32	108	0.27	0.31
September	492	60	158	0.40	0.45
The year	8,490	††32	538	1.34	18.30

NOTES—Gage heights affected by ice December 10, 1917, to February 13, 1918, and discharge estimated from climatological data. ††Estimated. Maximum 10,100 second-feet February 20. Minimum 29 second-feet August 6 and 28.

OHIO BASIN—STATION NO. 33

CONNOQUENESSING CREEK NEAR HAZEN (CELIA)

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge at Hazen, or Celia, Beaver County.

Records Available.—Discharge measurements and gage heights from June 3, 1915, to September 30, 1918.

Drainage Area.—355 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, is located on the downstream side of the bridge and is read twice daily by Wilbert Hazen.

Channel.—The right bank is low and overflows at high stages; the left is high and precipitous and overflows slightly in extreme stages, and the bed is composed of rock.

Remarks.—This station is maintained in co-operation with the U. S. Engineer Office in Pittsburgh.

Discharge Measurements of Connoquenessing Creek near Hazen (Celia), Beaver County
(Drainage area 355 square miles)

No.	Date	Hydrographer	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
5	May 4	Wilson	197	1.74	97	0.6 method
6	May 20	Wilson	202	1.81	116	0.2 & 0.8 method
7	July 17	Wilson	401	3.03	757	0.2 & 0.8 method
	1918					
8	Jan. 5	Wilson	243	2.56	86	Under ice cover
9	July 18	Landis	24	1.30	18	Wading 150 feet below gage

Daily Mean Gage Heights, in feet, of Connoquenessing Creek near Hazen (Celia), Beaver County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.33	1.42	2.57	2.55	3.61	2.43	2.35	1.79	2.69	1.94	1.62	1.72
2	1.29	1.49	2.42	2.44	2.76	2.17	2.35	1.74	2.76	1.89	1.52	1.62
3	1.27	1.45	2.25	2.72	*5.18	2.17	2.45	1.86	2.79	1.86	1.50	1.58
4	1.24	1.45	2.15	2.95	5.18	2.15	2.25	2.14	2.79	1.69	1.45	1.52
5	1.24	1.52	2.17	†6.54	5.07	‖2.09	2.75	2.54	2.89	1.64	1.32	1.55
6	1.24	1.52	2.17	6.01	4.78	2.03	4.00	2.49	2.94	1.54	1.38	2.30
7	1.23	1.54	2.09	4.11	4.48	2.15	4.05	2.36	2.59	1.52	1.42	2.95
8	1.24	1.48	1.94	3.34	4.34	3.05	3.80	2.26	2.89	1.69	1.42	3.45
9	1.22	1.47	1.99	2.98	4.31	2.97	3.00	2.22	4.34	2.09	1.40	3.38
10	1.22	1.51	2.12	2.96	3.91	2.83	2.70	2.16	5.29	3.04	1.40	2.40
11	1.23	1.63	2.01	2.60	3.54	4.65	2.45	2.06	4.22	3.12	1.38	2.40
12	1.24	1.58	2.08	2.24	3.31	5.95	2.43	1.99	3.44	2.36	1.35	2.25
13	1.26	1.53	2.09	*2.50	2.98	4.53	2.33	1.94	2.49	2.52	1.38	2.10
14	1.38	1.73	*2.25	3.42	2.90	3.67	2.17	1.94	2.32	2.36	1.88	1.95
15	1.45	2.00	2.33	3.66	2.72	3.63	2.15	1.84	2.24	2.26	1.92	2.35
16	1.42	1.87	2.25	3.66	2.92	3.13	2.05	1.79	2.19	2.24	1.62	1.72
17	1.38	1.76	2.26	3.41	2.74	3.15	1.97	1.76	2.06	3.04	1.55	1.60
18	**1.34**	**1.72**	**2.15**	**3.31**	**3.28**	**3.23**	**1.93**	**1.74**	**1.94**	**3.12**	**1.40**	**1.55**
19	1.66	1.69	2.09	3.26	3.54	2.87	2.03	1.79	1.86	3.42	1.32	1.55
20	2.42	1.65	2.07	3.14	3.91	2.73	2.05	1.78	1.84	2.58	‡1.22	1.50
21	2.14	1.61	2.09	3.00	3.54	2.70	2.03	1.74	1.79	2.28	1.38	1.50
22	1.93	1.56	4.47	6.54	3.07	2.66	1.95	1.74	1.74	2.10	1.48	1.55
23	1.74	1.55	4.52	4.28	2.97	2.73	1.93	1.99	1.66	2.10	4.52	1.55
24	1.62	2.45	5.77	3.34	4.36	5.75	1.83	1.94	1.82	1.98	3.70	1.55
25	1.57	2.29	5.22	3.02	3.90	4.25	1.77	1.84	1.86	1.98	2.85	1.48
26	1.52	2.01	4.99	2.64	3.28	3.50	1.83	1.79	2.19	1.90	2.00	1.42
27	1.49	1.92	6.07	2.44	3.73	3.20	1.90	1.76	2.02	2.38	1.82	1.40
28	1.48	1.89	5.49	2.58	2.51	3.03	1.85	1.82	2.09	2.42	1.72	1.45
29	1.42	3.01	3.95	2.71	-------	2.77	1.77	4.16	1.92	1.88	1.75	1.45
30	1.40	2.85	3.16	3.84	-------	2.63	1.80	2.96	1.94	1.75	2.02	1.40
31	1.38	-------	2.77	3.52	-------	2.45	-------	2.52	-------	1.72	1.80	-------

NOTES—*Creek frozen December 14 to 27, 1916; January 13 to 22 and February 3 to 28, 1917, inclusive. †Maximum 8.20 feet at 10 p. m. estimated from hydrograph. ‡Minimum 1.20 feet at 7 a. m. ‖Interpolated.

Daily mean Gage Heights, in feet, of Connoquenessing Creek near Hazen (Celia), Beaver County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.50	2.30	2.15	3.45	2.21	3.29	1.84	2.27	††3.2	1.45	1.85	2.35
2	1.50	2.25	2.15	3.22	2.24	3.36	1.84	2.22	††3.0	1.45	1.65	2.25
3	1.52	2.15	2.10	3.00	2.23	2.99	1.84	2.22	††2.7	1.47	1.50	2.20
4	2.02	2.14	2.05	3.90	2.26	2.76	2.57	2.20	2.40	1.50	1.45	2.15
5	2.18	2.10	2.00	2.55	2.17	2.96	2.10	2.14	2.27	1.47	1.45	2.12
6	1.78	2.10	1.92	3.48	2.11	3.04	2.00	2.10	2.25	1.45	1.42	2.05
7	1.60	2.05	1.90	3.08	-------	2.99	2.00	2.02	2.20	1.50	1.40	2.00
8	1.60	2.00	1.95	2.85	2.64	2.94	2.64	2.02	2.13	1.43	1.55	2.55
9	1.58	2.00	1.92	2.55	4.74	2.86	2.57	1.94	2.05	1.35	2.65	2.35
10	1.52	1.98	*1.98	2.50	7.64	3.44	2.57	2.10	2.05	1.35	2.70	2.22
11	1.50	1.95	2.05	2.48	8.49	2.66	2.52	2.17	2.00	1.35	2.62	2.12
12	1.55	1.95	2.10	2.43	9.09	2.49	2.44	2.20	2.00	1.37	2.48	2.08
13	1.50	1.90	2.05	2.40	8.02	2.16	2.40	3.44	1.95	1.40	2.38	2.02
14	1.60	1.85	2.02	2.30	5.14	3.54	2.37	4.00	1.93	1.37	2.30	1.98
15	1.60	1.80	2.00	2.25	6.44	4.14	2.34	3.52	1.90	1.35	2.22	2.45
16	1.60	1.75	2.05	2.20	5.34	3.60	2.64	3.47	1.85	1.33	2.15	2.25
17	2.18	1.80	2.12	2.18	4.04	3.29	3.00	3.24	1.80	1.30	2.10	2.35
18	2.10	1.80	2.15	2.12	3.26	2.86	3.64	2.94	1.75	1.32	2.00	2.35
19	2.00	1.75	2.10	2.08	3.06	2.74	3.57	2.82	1.73	1.28	1.95	2.35
20	1.80	1.70	2.05	2.05	10.19	2.62	3.54	2.74	2.15	1.25	1.88	2.35
21	2.05	1.68	2.05	2.00	7.69	2.49	3.50	2.57	2.70	1.25	1.80	2.05
22	2.50	1.70	2.35	2.00	3.56	2.42	3.47	2.40	2.20	1.20	1.72	1.98
23	2.95	1.80	2.50	1.90	3.36	2.29	3.52	2.27	1.93	‡1.12	1.58	1.92
24	4.55	1.80	2.60	1.95	3.49	2.16	3.50	2.22	1.83	2.65	1.50	1.88
25	†6.25	1.80	5.50	2.00	5.12	2.16	3.44	2.77	1.75	3.42	1.38	1.78
26	5.20	1.75	4.90	2.00	3.94	2.14	2.54	3.30	1.67	2.85	1.30	1.68
27	4.25	1.70	4.50	2.02	3.24	2.09	2.42	3.24	1.65	2.55	1.30	1.55
28	3.70	1.75	4.62	2.08	2.89	2.04	2.34	3.17	1.60	2.38	1.40	1.42
29	3.38	1.80	4.50	2.02	-------	1.96	2.32	3.12	1.57	2.28	3.50	1.32
30	2.90	1.80	4.20	2.12	-------	1.89	2.32	5.52	1.53	2.18	2.35	1.28
31	2.58	-------	3.65	2.15	-------	1.89	-------	††3.5	-------	2.05	1.75	-------

NOTES—*Gage heights affected by ice December 10, 1917 to February 21, 1918. ††Estimated. †Maximum 7.0 feet from hydrograph at 8 a. m. ‡Minimum 1.10 feet.

OHIO BASIN—STATION NO. 34

RACCOON CREEK AT MOFFATT'S MILL, BEAVER COUNTY

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge, 500 feet below Moffatt's Mill and 4½ miles above the mouth of the creek.

Records Available.—Discharge measurements and gage heights is located on the downstream side of the bridge and is read twice daily by Alonzo L. McMahon.

Drainage Area.—178 square miles.

Gage.—A standard chain gage, whose elevation of zero is arbitrary, from May 27, 1915, to September 30, 1918.

Channel.—The right bank is high and precipitous and does not overflow; the left overflows above and below the bridge, and the bed is rocky.

Remarks.—This station is maintained in co-operation with the U. S. Engineer Office in Pittsburgh.

Discharge Measurements of Raccoon Creek at Moffatt's Mill, Beaver County.
(Drainage area 178 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1917		Sq. ft.	Feet	Sec.-ft.	
4	April 17	Reckord	191	2.44	119	0.6 method
5	April 19	Reckord	218	2.66	174	0.6 method
6	July 6	Wilson	161	2.25	45	0.2 & 0.8 method

Daily Mean Gage Heights, in feet, of Raccoon Creek at Moffatt's Mill, Beaver County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.75	1.89	2.67	2.54	3.39	2.90	2.61	2.30	3.08	2.32	2.25	2.33
2	1.73	2.03	2.56	2.53	3.10	2.84	2.54	2.30	2.72	3.18	2.23	2.25
3	1.73	2.05	2.48	2.66	2.54	2.88	2.52	2.28	3.01	3.62	2.20	2.23
4	1.71	2.04	2.40	3.00	2.47	2.94	2.48	2.30	2.77	3.03	2.19	2.33
5	1.68	2.03	2.49	4.57	2.65	2.55	2.59	2.35	2.76	2.47	2.12	2.28
6	1.67	2.02	2.41	4.66	2.70	*2.48	3.64	2.38	3.91	2.25	2.07	2.27
7	1.67	1.99	2.39	3.58	2.74	2.49	3.54	2.39	3.78	2.21	2.00	2.25
8	1.65	1.99	2.34	3.15	2.66	3.09	3.21	2.36	3.46	2.19	1.98	3.28
9	‡1.65	2.00	2.36	3.00	2.55	3.41	2.98	2.35	3.46	2.16	1.97	2.72
10	1.65	2.01	2.31	2.92	2.53	3.52	2.74	2.34	3.02	3.40	1.96	2.48
11	1.65	2.00	2.27	2.71	2.44	4.50	2.68	2.33	2.82	3.45	1.94	2.41
12	1.67	2.00	2.31	2.52	2.40	5.32	2.63	2.32	2.74	3.38	1.94	2.38
13	1.69	2.01	*2.23	2.46	2.27	3.57	2.56	2.31	2.64	3.32	2.04	2.34
14	1.69	2.05	2.20	2.51	*2.31	3.80	2.48	2.30	2.48	3.36	2.36	2.28
15	1.70	2.09	2.27	2.55	2.30	3.76	2.43	2.29	2.36	3.36	2.23	2.21
16	1.73	2.07	2.31	*2.98	2.33	3.49	2.43	2.23	2.29	3.00	2.19	2.18
17	1.75	2.03	2.31	3.19	2.38	3.18	2.42	2.15	2.24	2.72	2.12	2.18
18	1.77	1.99	2.28	3.19	2.38	3.10	2.40	2.21	2.23	3.70	2.02	2.17
19	1.77	1.95	2.24	3.22	2.57	3.12	2.65	2.25	2.21	3.18	1.94	2.16
20	1.81	1.95	2.19	3.18	2.64	3.06	2.52	2.24	2.17	2.80	1.96	2.15
21	1.81	1.93	2.17	3.18	2.76	2.96	2.42	2.24	2.14	2.48	1.94	2.12
22	1.83	1.94	3.31	†6.82	2.46	2.86	2.42	2.24	2.12	2.27	1.94	2.09
23	1.83	1.99	3.17	3.96	3.14	2.76	2.36	2.21	2.10	2.26	3.62	2.04
24	1.83	2.61	2.92	3.38	2.74	4.65	2.33	2.25	2.48	2.23	3.50	2.00
25	1.83	2.47	2.89	3.11	2.74	3.47	2.34	2.21	2.38	3.02	2.61	1.98
26	1.85	2.42	2.71	2.90	2.76	3.26	2.35	2.18	2.28	3.07	2.18	1.96
27	1.87	2.41	3.47	2.66	2.80	3.04	2.34	2.16	2.27	3.00	2.09	1.94
28	1.88	2.53	4.13	3.20	2.86	2.96	2.31	2.16	2.52	2.88	2.06	1.93
29	1.87	2.83	3.35	3.62	-------	2.88	2.32	2.60	2.85	2.58	2.10	1.90
30	1.86	2.77	2.90	3.54	-------	2.82	2.30	2.52	2.66	2.29	2.42	1.90
31	1.87	-------	2.79	3.19	-------	2.75	-------	2.42	-------	‖2.27	2.36	-------

NOTES—*Creek frozen December 13 to 22, 1916; January 16 to 21; February 14 to 23 and March 6 to 8, 1917, inclusive. †Maximum 7.90 feet at noon. ‡Minimum 1.64 feet October 9 and 10, 1916. ‖Interpolated.

Daily Mean Gage Heights, in feet, of Raccoon Creek at Moffatt's Mill, Beaver County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.98	3.38	2.16	3.18	3.04	3.16	2.22	2.46	3.25	1.94	2.05	2.50
2	1.96	3.08	2.18	3.14	3.04	2.98	2.21	2.44	3.02	1.90	1.91	2.27
3	1.93	2.78	2.20	3.11	3.05	2.88	2.22	2.45	2.86	1.88	1.80	2.18
4	2.00	2.62	2.22	3.08	3.04	2.78	2.21	2.43	2.61	1.88	1.77	2.17
5	1.98	2.57	2.24	3.05	3.04	2.82	2.20	2.40	2.48	1.90	1.74	2.44
6	1.94	2.56	2.26	3.04	3.06	2.92	2.20	2.43	2.41	1.90	1.74	2.22
7	2.02	2.54	2.28	3.08	3.08	2.88	2.24	2.46	2.64	1.90	1.88	2.12
8	2.04	2.52	2.30	3.06	3.14	3.04	2.32	2.49	2.50	1.86	2.31	2.02
9	2.01	2.49	*2.45	3.04	4.87	3.18	2.28	2.46	2.38	1.84	2.22	1.98
10	2.00	2.46	-------	3.04	4.52	3.52	2.30	2.46	2.36	1.82	2.09	2.01
11	2.02	2.40	-------	3 02	4.12	3.16	2.44	2.51	2.34	1.80	2.54	2.05
12	2.05	2.35	-------	3.03	4.84	2.98	3.16	2.47	2.33	1.80	2.45	2.11
13	2.09	2.32	-------	3.02	5.12	2.92	2.88	2.80	2.26	1.78	2.06	2.07
14	2.12	2.32	-------	3.04	4.71	3.28	2.88	3.08	2.21	1.78	1.88	2.00
15	2.11	2.29	-------	3.06	4.20	3.13	2.85	2.76	2.18	1.80	1.70	2.01
16	2.13	2.25	2.50	3.06	3.31	2.95	3.05	2.60	2.18	1.78	1.44	2.00
17	2.14	2.24	2.44	3.05	2.93	2.86	3.19	2.49	2.23	1.79	‡1.39	2.03
18	2.17	2.22	2.39	3.06	2.74	2.75	2.82	2.43	2.18	1.77	‡1.39	2.09
19	2.22	2.22	2.37	3.05	3.88	2.66	2.68	2.39	2.12	1.76	1.42	2.10
20	2.98	2.19	2.33	3.04	†4.78	2.59	2.60	2.44	2.06	1.74	1.41	2.07
21	2.58	2.17	3.52	3.05	3.78	2.56	2.56	2.82	2.08	1.74	1.50	2.05
22	2.50	2.16	3.68	3.04	3.18	2.49	2.56	2.83	2.12	1.72	1.93	2.02
23	2.46	2.12	3.40	3.06	3.04	2.42	2.56	3.55	2.09	1.75	1.47	1.99
24	2.41	2.09	3.34	3.06	3.08	2.40	2.53	3.05	2.07	2.83	1.73	1.99
25	4.35	2.08	3.89	3.04	2.94	2.40	2.47	3.42	2.03	2.85	1.86	1.99
26	3.87	2.08	3.66	3.06	4.10	2.38	2.49	4.11	2.01	2.61	1.81	1.97
27	3.66	2.08	3.38	3.05	3.29	2.33	2.44	3.82	2.00	2.35	1.85	2.00
28	3.62	2.10	3.32	3.06	3.23	2.31	2.41	2.95	1.99	1.96	1.91	1.97
29	3.62	2.12	3.25	3.04	-------	2.30	2.45	2.89	1.95	1.98	1.97	1.93
30	4.26	2.16	3.23	3.05	-------	2.27	2.46	3.38	1.96	2.18	2.07	1.95
31	3.72	-------	3.21	3.04	-------	2.24	-------	3.80	-------	2.18	2.50	-------

NOTES—*Gage heights affected by ice December 9, 1917 to February 14, 1918. †Maximum 5.8 feet from hydrograph at 2 a. m. ‡Minimum 1.38 feet.

OHIO BASIN—STATION NO. 35

SHENANGO RIVER NEAR TURNERVILLE

DESCRIPTION OF STATION

Location.—At a weir on the upstream side of the single span, through truss, highway bridge at Turnerville, Crawford County.

Records Available.—Discharge complete from February 1, 1912, to September 30, 1918.

Drainage Area.—152 square miles.

Gage.—A Bristol recording gage, whose elevation of zero is 975.62 feet above mean sea level, is located on the east abutment of the bridge.

Discharge Measurements of Shenango River near Turnerville, Crawford County.
(Drainage area 152 square miles)

No.	Date	Hydrographers	Area	Head on weir	Dis.	Remarks
			Sq. ft.	Feet	Sec.-ft.	
60	Jan. 3	McElrath & Miller	359	1.33	297	Ice cover
61	Jan. 4	McElrath & Miller	385	1.60	339	Ice cover
62	Jan. 5	McElrath & Miller	707	5.11	1,060	Ice cover
63	Jan. 5	McElrath & Miller	746	5.48	1,310	Ice cover
64	Jan. 10	McElrath & Miller	489	2.36	591	Ice cover 100 ft. above gage
65	Jan. 10	McElrath & Miller	451	2.34	703	Ice cover
66	Jan. 17	McElrath & Miller	260	0.61	91.9	Ice cover
67	Jan. 30	Ferris & McElrath	306	0.96	185	Edge of ice sheet
68	Jan. 30	Ferris & McElrath	351	0.96	204	5 feet below ice sheet
69	Jan. 30	Ferris & McElrath	245	1.02	353	Ice cover
70	Jan. 31	McElrath & Miller	386	1.29	506	3 feet below ice cover
71	Jan. 31	McElrath & Miller	339	1.29	279	Face of ice sheet
72	Feb. 19	McElrath & Miller	272	0.37	50.8	5 feet below ice sheet
73	Mar. 12	McElrath & Miller	761	5.62	1,840	
74	Mar. 15	Ferris & McElrath	540	2.71	717	Wire 6 feet above weir
75	Mar. 16	Ferris & McElrath	499	2.42	637	Wire 6 feet above weir
76	Mar. 17	McElrath & Miller	450	1.99	494	Wire 6 feet above weir
77	Mar. 22	McElrath & Miller	420	1.72	482	Wire 6 feet above weir
78	Aug. 21	McElrath	19.5	0.06	8.14	Wading 200 feet below gage
	1918					
79	Jan. 26	McElrath	20	0.18	19	Measured at riffle
80	Feb. 12	McElrath	399	1.89	247	Ice cover, 6 feet above weir
81	Feb. 18	McElrath	670	3.92	683	Ice cover, 6 feet above weir
82	Feb. 27	McElrath	459	2.28	528	Ice cover, 6 feet above weir

Measurements Nos. 60 to 82 inclusive taken by vertical velocity method

Daily Mean Gage Heights, in feet, of Shenango River near Turnerville, Crawford County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.10	0.18	1.27	2.03	1.75	2.45	1.07	0.38	1.80	0.79	0.15	0.57
2	0.10	0.18	1.25	1.62	2.24	1.86	1.46	0.37	1.51	0.97	0.12	0.54
3	0.09	0.18	1.13	1.36	2.13	1.37	2.27	0.37	1.46	0.77	0.09	0.53
4	0.08	0.17	0.95	1.64	1.69	1.10	2.51	0.38	1.28	0.70	0.08	0.57
5	0.08	0.17	0.90	4.48	1.20	0.88	1.89	0.63	1.04	0.69	0.08	0.49
6	0.08	0.17	0.84	6.17	0.81	0.67	1.87	0.76	1.02	0.60	0.08	0.41
7	0.07	0.18	0.78	6.25	0.61	0.68	2.62	1.00	1.35	0.47	0.08	0.55
8	0.07	0.17	0.78	5.13	0.56	0.82	3.47	1.31	1.35	0.41	0.07	0.53
9	0.07	0.17	0.78	3.24	0.52	1.06	3.08	1.29	1.76	0.38	0.07	0.53
10	0.09	0.18	0.79	2.37	0.52	1.18	2.20	1.21	2.79	0.81	0.06	0.50
11	0.13	0.17	0.74	2.05	0.43	2.88	1.59	0.96	3.21	1.03	0.06	0.44
12	0.14	0.19	0.73	1.67	0.46	5.40	1.15	0.75	3.02	1.11	0.06	0.35
13	0.12	0.21	0.62	1.34	0.44	5.37	0.93	0.63	2.33	1.34	0.11	0.26
14	0.14	0.24	0.56	1.13	0.37	3.90	0.86	0.52	1.68	1.37	0.17	0.23
15	0.17	0.26	0.61	0.91	0.35	2.85	0.76	0.43	1.27	1.42	0.14	0.21
16	0.20	0.29	0.55	0.70	0.34	2.43	0.70	0.38	1.01	1.26	0.13	0.20
17	0.17	0.31	0.51	0.61	0.33	2.01	0.61	0.33	0.83	1.04	0.11	0.19
18	0.13	0.29	0.49	0.54	0.34	1.82	0.59	0.29	0.72	0.97	0.09	0.18
19	0.20	0.27	0.45	0.47	0.38	1.74	0.66	0.27	0.62	0.84	0.09	0.18
20	0.26	0.26	0.44	0.45	0.55	1.65	0.67	0.59	0.53	0.84	0.09	0.18
21	0.29	0.27	0.42	0.47	0.61	1.87	0.65	0.65	0.46	0.72	0.09	0.20
22	0.31	0.27	0.41	0.54	0.75	1.72	0.69	0.75	0.42	0.63	0.11	0.21
23	0.32	0.29	0.38	0.54	1.00	1.68	0.64	1.01	0.38	0.56	0.12	0.18
24	0.32	0.39	0.39	0.53	1.52	2.06	0.57	1.11	0.53	0.49	0.28	0.17
25	0.29	0.42	0.40	0.54	1.60	2.01	0.52	1.25	0.44	0.44	0.45	0.16
26	0.24	0.40	0.42	0.54	1.51	1.97	0.51	1.24	0.43	0.40	0.48	0.16
27	0.21	0.50	0.65	0.54	2.17	1.52	0.45	1.37	0.58	0.40	0.43	0.15
28	0.20	0.66	*1.42	0.53	2.39	1.23	0.44	1.60	0.57	0.37	0.38	0.16
29	0.18	1.03	1.56	0.53	-------	1.11	0.47	2.09	0.59	0.28	0.40	0.17
30	0.18	1.12	1.67	0.95	-------	1.04	0.44	2.55	0.76	0.20	0.54	0.19
31	0.19	-------	2.00	1.30	-------	0.96	-------	2.19	-------	0.18	0.54	-------

NOTES—*River frozen December 28, 1916, to March 11, 1917, inclusive.

Daily Mean Gage Heights, in feet, of Shenango River near Turnerville, Crawford County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917–1918												
1	0.23	4.76	0.81	------	------	------	0.44	0.53	0.56	0.14	0.33	0.10
2	0.31	3.41	0.85	------	------	------	0.41	0.45	0.52	0.19	0.26	0.10
3	0.34	2.34	0.94	------	------	------	0.39	0.41	0.44	0.19	0.18	0.08
4	0.40	1.72	1.00	------	------	------	0.41	0.38	0.34	0.14	0.11	0.09
5	0.50	1.46	0.93	------	------	2.09	0.41	0.37	0.34	0.12	0.10	0.09
6	0.53	1.30	0.78	------	------	2.09	0.39	0.33	0.30	0.11	0.09	0.15
7	0.54	1.14	0.71	------	------	2.08	0.38	0.36	0.50	0.11	0.07	0.19
8	0.51	1.03	0.53	------	------	1.86	0.42	0.32	0.42	0.10	0.07	0.18
9	0.49	0.96	*	------	------	1.99	0.49	0.31	0.50	0.09	0.07	0.11
10	0.45	0.86	------	------	------	3.61	0.50	0.40	0.68	0.09	0.09	0.11
11	0.39	0.79	------	------	------	3.44	0.56	0.45	0.69	0.09	0.12	0.09
12	0.35	0.74	------	------	------	3.83	0.72	0.54	0.58	0.08	0.11	0.15
13	0.40	0.70	------	------	------	3.25	0.86	1.54	0.47	0.07	0.07	0.20
14	0.42	0.65	------	------	------	6.40	1.03	2.36	0.48	0.07	0.08	0.19
15	0.43	0.60	------	------	------	7.44	1.05	2.90	0.64	0.07	0.05	0.24
16	0.45	0.57	------	------	------	6.22	0.95	2.09	0.73	0.07	0.06	0.32
17	0.44	0.54	------	------	------	3.87	0.84	1.42	0.58	0.07	0.05	0.24
18	0.45	0.51	------	------	------	2.41	0.80	1.03	0.46	0.07	0.05	0.28
19	0.70	0.49	------	------	------	1.77	0.85	0.76	0.29	0.06	0.03	0.27
20	1.23	0.49	------	------	------	1.47	0.87	0.65	0.20	0.06	0.04	0.29
21	1.52	0.48	------	------	------	1.26	0.87	0.55	0.17	0.06	0.02	0.29
22	2.12	0.48	------	------	------	1.06	0.79	0.68	0.27	0.05	0.02	0.36
23	2.01	0.55	------	------	------	0.92	0.75	0.84	0.35	0.04	0.02	0.38
24	2.94	0.55	------	------	------	0.84	0.84	0.51	0.37	0.05	0.03	0.40
25	4.71	0.51	------	------	------	0.77	0.79	0.48	0.33	0.05	0.03	0.44
26	5.52	0.54	------	------	------	0.71	0.82	0.59	0.30	0.07	0.03	0.47
27	4.92	0.52	------	------	------	0.64	0.80	0.53	0.18	0.09	0.02	0.44
28	3.63	0.61	------	------	------	0.59	0.66	0.50	0.15	0.17	0.03	0.40
29	3.43	0.58	------	------	------	0.55	0.64	0.46	0.16	0.22	0.06	0.40
30	4.91	0.65	------	------	------	0.51	0.63	0.46	0.16	0.17	0.11	0.38
31	5.26	------	------	------	------	0.46	------	0.55	------	0.30	0.15	------

NOTES—*Gage heights affected by ice December 9, 1917 to March 4, 1918.

Daily discharge, in second-feet, of Shenango River near Turnerville, Crawford County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	8	16	344	*485	*423	*581	255	51	495	149	12	92
2	8	16	347	*394	*532	*447	406	48	421	209	10	97
3	8	15	284	*328	*507	*331	610	48	406	144	8	94
4	7	14	202	*399	*410	*250	667	51	347	124	7	78
5	7	14	184	*1,113	*280	*177	517	107	240	122	7	59
6	7	14	165	*2,070	*156	*117	513	141	230	99	7	57
7	7	16	146	*2,132	*102	*120	694	222	372	70	7	87
8	7	14	146	*1,364	*90	*159	914	358	372	57	7	83
9	7	14	146	*765	*80	*236	808	351	485	51	7	83
10	8	16	149	*562	*80	*274	594	320	735	156	6	76
11	11	14	136	*489	*61	*679	441	205	843	235	6	63
12	11	17	133	*405	*68	1,592	293	138	792	274	6	45
13	10	20	104	*322	*63	1,579	194	107	624	368	9	28
14	11	24	90	*259	*48	1,038	171	80	465	378	14	23
15	14	28	102	*187	*45	749	141	61	344	394	11	20
16	18	33	87	*124	*43	648	124	51	226	340	11	18
17	14	37	78	*102	*41	547	102	41	162	240	9	17
18	11	33	74	*85	*43	500	97	33	130	209	8	16
19	18	29	65	*70	*51	489	114	29	104	165	8	16
20	28	28	63	*65	*87	457	117	97	83	165	8	16
21	33	29	59	*70	*102	512	112	112	68	130	8	18
22	37	29	57	*85	*138	475	122	138	59	107	9	20
23	39	33	51	*85	*215	465	109	226	51	90	10	16
24	39	53	53	*83	*370	560	92	274	83	74	31	14
25	33	59	55	*85	*390	547	80	336	63	63	65	13
26	24	55	59	*85	*367	537	78	332	61	55	72	13
27	20	76	112	*85	*516	423	65	378	94	55	61	12
28	18	114	*345	*83	*567	528	63	444	92	48	51	13
29	16	235	*380	*83	------	274	70	567	97	31	55	14
30	16	279	*405	*198	------	240	63	677	141	21	85	17
31	17	------	*478	*310	------	205	------	502	------	16	85	------

NOTE—*Ice Conditions.

Daily discharge, in second-feet, of Shenango River near Turnerville, Crawford County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917–1918												
1	23	1,328	156	65	18	898	63	88	90	11	41	8
2	37	897	168	39	18	927	57	65	80	17	28	8
3	43	627	198	18	18	785	53	57	63	17	16	7
4	55	475	222	16	20	583	57	51	43	11	9	8
5	76	406	194	16	20	567	57	48	43	10	8	8
6	85	354	146	13	21	567	53	41	35	9	8	12
7	85	289	127	13	20	565	51	47	76	9	7	17
8	78	235	83	17	20	510	59	39	59	8	7	16
9	74	205	74	21	26	542	74	37	76	8	7	9
10	65	171	65	19	35	953	76	55	120	8	8	9
11	53	149	55	19	57	905	90	65	122	8	10	8
12	45	136	47	23	385	1,017	130	85	94	7	9	12
13	55	124	37	43	1,211	854	171	428	70	7	7	18
14	59	112	37	31	1,495	2,255	235	631	72	7	7	17
15	61	99	37	20	2,052	3,305	245	761	109	7	5	24
16	65	92	35	21	1,517	2,110	202	567	133	7	6	39
17	63	85	35	21	564	1,029	165	394	94	7	5	24
18	65	78	39	21	675	643	180	235	68	7	5	31
19	124	74	37	24	1,390	487	168	141	33	6	4	29
20	328	74	35	24	1,115	409	174	112	18	6	4	33
21	423	72	80	23	564	340	174	87	14	6	3	33
22	575	72	141	20	430	250	149	120	29	5	3	47
23	547	87	149	17	371	191	138	165	45	4	3	51
24	771	87	162	•16	320	165	135	78	49	5	4	55
25	1,309	78	269	16	341	144	149	72	41	5	4	63
26	1,650	85	289	16	358	127	159	97	35	7	4	70
27	1,389	89	279	16	480	109	152	83	16	8	3	63
28	959	102	255	14	567	97	114	76	12	14	4	55
29	902	94	191	17	-------	87	109	68	13	21	6	55
30	1,385	112	120	17	-------	78	107	68	13	14	9	51
31	1,530	-------	90	16	-------	68	-------	87	-------	35	12	-------

Estimated Monthly Discharge of Shenango River near Turnerville, Crawford County.
(Drainage area 152 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916–1917					
October	39	7	16.5	0.109	0.126
November	279	14	45.8	0.301	0.336
December	478	51	164	1.079	1.244
January	2,132	65	418	2.750	3.171
February	567	41	210	1.382	1.439
March	1,592	117	501	3.296	3.800
April	914	63	288	1.895	2.115
May	677	29	213	1.401	1.615
June	843	51	290	1.908	2.129
July	394	16	150	0.987	1.138
August	85	6	22.6	0.149	0.172
September	97	12	40.6	0.267	0.298
The year	2,132	6	196.8	1.295	17.583

NOTE—Ice conditions December 28, 1916, to March 11, 1917, inclusive.

Estimated Monthly Discharge of Shenango River near Turnerville, Crawford County
(Drainage area 152 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October,	1,650	23	419	2.757	3.179
November,	1,328	72	229	1.507	1.682
December,	289	35	124	0.816	0.941
January,	65	13	21.7	0.143	0.165
February,	2,052	18	504	3.316	3.452
March,	3,305	68	696	4.579	5.280
April,	245	51	126	0.829	0.925
May,	761	37	159	1.046	1.206
June,	133	12	58.8	0.387	0.432
July,	35	4	9.7	0.064	0.074
August,	41	3	8.3	0.054	0.062
September,	70	7	29.3	0.193	0.215
The year,	3,305	3	197	1.296	17.613

NOTES—Gage heights affected by ice December 9, 1917, to March 4, 1918.

OHIO BASIN—STATION NO. 36

LITTLE SHENANGO RIVER AT GREENVILLE

DESCRIPTION OF STATION

Location.—At third highway bridge above the mouth, known as Quaker Bridge.

Records Available.—Discharge complete from January 1, 1914, to September 30, 1918.

Drainage Area.—107 square miles.

Gage.—From October 1 to November 4, 1915, a staff gage, whose elevation of zero is 944.50 feet above mean sea level, located on the upstream side of the right abutment, was read by M. Loutzenhiser. On November 4, 1915, a Bristol self-recording gage was installed at the upstream side of the bridge adjacent to the staff gage and is placed on the same datum.

Channel.—Both banks are high and not subject to overflow, and the bed is composed of sand and gravel.

Discharge Measurements of Little Shenango River at Greenville, Mercer County.
(Drainage area 107 square miles)

No.	Date	Hydrographers	Area	G. H.	Dis.	Remarks
	1916		Sq.ft.	Feet	Sec.-ft.	
18	Mar. 6	McElrath,	255	1.71	45.2	Ice cover.
19	Mar. 16	McElrath,	462	3.90	223	Ice cover. Slush ice.
20	July 27	Ferris,	34.4	1.20	15.4	Wading above gage.
	1917					
21	Dec. 18	McElrath,	133	1.59	38.5	Ice cover.
	1918					
22	Jan. 17	McElrath & Patterson,	37	1.75	30	Ice cover.
23	Jan. 28	McElrath & Patterson,	31	1.76	30	Ice cover.
24	Feb. 14	McElrath & Patterson,	447	*3.80	923	Free flow.
25	Feb. 28	McElrath & Patterson,	297	*2.19	245	Free flow.

*Ice gorges in stream below station.

Daily Mean Gage Heights, in feet, of Little Shenango River at Greenville, Mercer County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.20	1.38	1.93				2.00	1.58	2.41	2.30	1.24	1.24
2	1.18	1.33	1.74				2.25	1.55	2.17	2.19	1.22	1.21
3	1.14	1.26	1.61				2.27	1.49	1.96	1.90	1.21	1.20
4	1.07	1.23	1.61				2.01	1.48	1.81	1.64	1.20	1.20
5	1.10	1.24	1.84				1.93	2.18	1.72	1.58	1.19	1.20
6	1.18	1.24	1.84				2.68	2.35	2.10	1.53	1.20	1.32
7	1.14	1.23	1.63				3.07	2.21	3.00	1.51	1.22	1.42
8	1.11	1.23	1.57				3.02	2.21	2.99	1.53	1.23	1.47
9	1.11	1.24	1.65				2.38	1.96	4.72	1.53	1.26	1.48
10	1.12	1.35	1.73				2.07	1.82	4.09	2.19	1.26	1.36
11	1.16	1.47	1.75			3.70	1.98	1.72	3.46	2.53	1.26	1.28
12	1.18	1.42	1.70			4.26	1.91	1.63	2.39	2.07	1.24	1.24
13	1.19	1.29	1.71			2.82	1.84	1.59	2.04	1.98	1.24	1.20
14	1.33	1.41	*			2.60	1.78	1.56	1.91	2.27	1.44	1.19
15	1.42	1.61				2.63	1.75	1.52	1.81	3.01	1.44	1.19
16	1.34	1.47				2.23	1.71	1.47	1.77	2.19	1.35	1.18
17	1.24	1.36				2.33	1.63	1.44	1.72	1.92	1.29	1.18
18	1.21	1.37				2.38	1.60	1.42	1.64	2.12	1.26	1.18
19	1.38	1.40				2.12	1.73	1.46	1.60	2.10	1.24	1.18
20	1.70	1.33				2.07	1.89	1.97	1.53	1.84	1.22	1.18
21	1.64	1.33				2.46	1.81	1.93	1.49	1.76	1.23	1.18
22	1.49	1.30				2.25	1.71	2.04	1.46	1.69	1.23	1.18
23	1.37	1.38				2.20	1.62	2.54	1.44	1.75	1.35	1.17
24	1.31	1.91				3.15	1.62	2.10	2.08	1.66	1.43	1.17
25	1.29	1.94				2.59	1.59	1.96	1.79	1.61	1.43	1.17
26	1.23	1.79				2.15	1.72	1.85	1.74	1.60	1.39	1.18
27	1.15	1.68				2.00	1.69	2.10	2.34	1.70	1.35	1.18
28	1.21	1.82				2.02	1.61	2.28	1.85	1.56	1.34	1.17
29	1.22	2.27				2.01	1.59	2.84	2.85	1.43	1.34	1.18
30	1.20	2.15				1.96	1.55	2.21	3.11	1.35	1.35	1.17
31	1.23					1.84		1.92		1.26	1.31	

NOTE—*Ice conditions December 14, 1916, to March 10, 1917, inclusive.

Daily Mean Gage Heights, in feet, of Little Shenango River at Greenville, Mercer County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	1.23	2.43	2.04	------	------	3.70	1.56	1.65	2.04	1.39	1.18	1.09
2	1.27	2.19	1.95	------	------	3.11	1.54	1.59	1.73	1.40	1.16	1.09
3	1.24	2.10	1.77	------	------	2.47	1.54	1.56	1.61	1.35	1.15	1.22
4	1.42	1.98	1.73	------	------	2.21	1.58	1.56	1.61	1.32	1.14	1.30
5	1.47	1.86	1.65	------	------	2.45	1.53	1.55	2.05	1.28	1.16	1.28
6	1.42	1.83	1.60	------	------	2.59	1.48	1.53	1.78	1.25	1.17	1.35
7	1.33	1.76	*	------	------	2.48	1.49	1.52	2.04	1.23	1.17	1.40
8	1.26	1.68	------	------	------	2.22	1.79	1.48	1.91	1.21	1.22	1.30
9	1.30	1.64	------	------	------	2.35	1.94	1.43	1.65	1.20	1.31	1.30
10	1.30	1.64	------	------	------	3.50	1.73	1.50	1.58	1.20	1.29	1.35
11	1.25	1.61	------	------	------	2.79	1.85	1.72	1.55	1.19	1.28	1.36
12	1.30	1.58	------	------	------	2.54	2.39	1.76	1.55	1.19	1.28	1.34
13	1.46	1.57	------	------	------	2.46	2.43	3.08	1.50	1.18	1.27	1.33
14	1.44	1.54	------	------	------	5.29	2.36	3.13	1.42	1.18	1.24	1.30
15	1.41	1.49	------	------	------	4.81	2.12	2.25	1.41	1.17	1.20	1.25
16	1.49	1.48	------	------	------	2.72	1.96	1.96	1.38	1.17	1.17	1.38
17	1.47	1.55	------	------	------	2.29	1.97	1.84	1.40	1.16	1.14	1.75
18	1.41	1.52	------	------	------	2.13	2.05	1.79	1.44	1.16	1.10	1.50
19	1.76	1.50	------	------	------	2.00	1.90	1.74	1.37	1.16	1.08	1.45
20	2.28	1.49	------	------	------	1.92	1.77	1.74	1.35	1.16	1.06	1.54
21	2.46	1.49	------	------	------	1.85	1.79	1.78	1.35	1.15	1.03	1.58
22	2.73	1.50	------	------	------	1.80	1.86	1.78	1.82	1.16	1.05	1.65
23	2.68	1.61	------	------	------	1.75	1.82	2.36	1.61	1.20	1.05	1.55
24	3.04	1.62	------	------	------	1.70	1.99	1.99	1.48	1.24	1.05	1.45
25	3.73	1.56	------	------	------	1.66	1.88	1.76	1.43	1.20	1.06	1.35
26	4.10	1.54	------	------	------	1.62	1.75	2.42	1.39	1.23	1.07	1.30
27	3.92	1.55	------	------	------	1.62	1.71	2.17	1.37	1.21	1.10	1.30
28	3.31	1.53	------	------	2.27	1.57	1.65	2.01	1.38	1.18	1.20	1.32
29	3.23	1.52	------	------	------	1.56	1.86	1.83	1.39	1.21	1.27	1.25
30	4.50	1.67	------	------	------	1.59	1.80	1.99	1.40	1.57	1.13	1.25
31	3.52	------	------	------	------	1.59	------	2.77	------	1.35	1.12	------

NOTES—*Gage heights affected by ice December 7, 1917 to February 27, 1918.

Daily discharge, in second-feet, of Little Shenango River at Greenville Mercer County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	15.0	31.0	125	*341	*208	*109	144	54.4	278	239	18.2	18.2
2	13.6	26.0	82	*277	*374	*314	222	50.5	196	203	16.6	15.8
3	10.8	19.8	58.7	*231	*357	*233	229	42.9	133	117	15.8	15.0
4	6.2	17.4	58.7	*281	*288	*176	147	41.8	96.3	63.8	15.0	15.0
5	8.0	18.2	103	*736	*197	*125	125	200	78.0	54.4	14.3	15.0
6	13.6	18.2	103	*1457	*110	*82.4	383	256	174	47.9	15.0	25.0
7	10.8	17.4	62.1	*1500	*71.8	*84.6	556	209	522	45.3	16.6	35.2
8	8.7	17.4	53.1	*963	*63.3	*112	532	209	517	47.9	17.4	40.7
9	8.7	18.2	65.5	*538	*56.3	*166	267	133	1,594	47.9	19.8	41.8
10	9.4	28.0	80.0	*396	*56.3	*193	165	98.6	1,153	203	19.8	29.0
11	12.2	40.7	84.0	*344	*42.9	901	139	78.0	758	324	19.8	21.4
12	13.6	35.2	74.0	*285	*47.9	1,272	120	62.1	270	165	18.2	18.2
13	14.3	22.2	76.0	*226	*44.4	442	103	55.7	156	139	18.2	15.0
14	26.0	34.1	*63.4	*182	*33.8	351	90	51.8	120	229	37.4	14.3
15	35.2	58.7	*71.8	*132	*31.6	363	84	46.6	96.3	527	37.4	14.3
16	27.0	40.7	*61.2	*87.4	*30.2	216	76	40.7	88.0	203	28.0	13.6
17	18.2	29.0	*54.8	*71.8	*28.8	250	62.1	37.4	78.0	122	22.2	13.6
18	15.8	30.0	*52.0	*59.8	*30.2	267	57	35.2	63.8	180	19.8	13.6
19	31.0	33.0	*45.7	*49.3	*35.9	180	80	39.6	57.0	174	18.2	13.6
20	74.0	26.0	*44.3	*45.7	*61.1	229	115	136	47.9	103	16.6	13.6
21	63.8	26.0	*41.5	*49.3	*71.8	297	96.3	125	42.9	86.0	17.4	13.6
22	42.9	23.0	*40.1	*59.8	*97.2	222	76	156	39.6	72.3	17.4	13.6
23	30.0	31.0	*35.8	*59.8	*151	206	60.4	328	37.4	84.0	28.0	12.9
24	24.0	120.0	*37.3	*58.4	*261	595	60.4	174	168	67.2	36.3	12.9
25	22.2	128.0	*38.7	*59.8	*274	347	55.7	133	92.0	58.7	36.3	12.9
26	17.4	92.0	*41.5	*59.8	*258	190	78	106	82.0	57.0	32.0	13.6
27	11.5	70.6	*78.9	*59.8	*363	144	72.3	174	253	74.0	28.0	13.6
28	15.8	98.6	*243	*58.4	*399	150	58.7	232	106	51.8	27.0	12.9
29	16.6	229.0	*267	*58.4	------	147	55.7	450	454	36.3	27.0	13.6
30	15.0	190.0	*285	*139	------	133	50.5	209	575	28.0	28.0	12.9
31	17.4	------	*336	*218	------	103	------	122	------	19.8	24.0	------

NOTE—*Discharge computed from Turnerville by percent of drainage area=107/152=70.4%. Ice gorges below gaging station.

Daily discharge, in second-feet, of Little Shenango River at Greenville, Mercer County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	17.4	285	156	35.2	15	901	51.8	65.5	156.0	32.0	13.6	7.4
2	20.6	203	130	32.0	15	575	49.2	55.7	80.0	33.0	12.2	7.4
3	18.2	174	88	30.0	15	301	49.2	51.8	58.7	28.0	11.5	16.6
4	35.2	129	80	25.0	13	269	54.4	51.8	58.7	25.0	10.8	23.0
5	40.7	108	65.5	23.0	16	293	47.9	50.5	159.0	21.4	12.2	21.4
6	35.2	101	57.0	22.2	19	347	41.8	47.9	90.0	19.0	12.9	28
7	26.0	86.0	*54.4	19.8	21	304	42.9	46.6	156.0	17.4	12.9	33
8	19.8	70.6	51.8	25.0	53	213	92.0	41.8	120.0	15.8	16.6	23
9	23.0	63.8	47.9	30.0	95	256	128	36.3	65.5	15.0	24.0	28
10	23.0	63.8	45.3	30.0	140	780	80	44.0	54.4	15.0	22.2	28
11	19.0	58.7	42.9	32.0	280	429	106	78	50.5	14.3	21.3	29
12	23.0	54.4	39.6	27.0	575	328	270	86	50.5	14.3	21.4	27
13	39.6	53.1	37.4	29.0	780	297	285	560	44.0	13.6	20.6	26
14	37.4	49.2	36.3	34.1	931	1,993	260	585	35.2	13.6	18.2	23
15	34.1	42.9	37.4	32.0	790	1,657	180	222	34.1	12.9	15.0	19
16	42.9	41.8	36.3	31.0	594	399	133	133	31.0	12.9	12.9	31
17	40.7	50.5	35.2	31.0	395	236	136	103	33.0	12.2	10.8	84
18	34.1	46.6	35.2	28.0	474	184	159	92	37.4	12.2	8.0	44
19	86.0	44.0	45.3	23.0	973	144	117	82	30.0	12.2	6.8	38.5
20	232	42.9	101	18.2	783	122	88	82	28.0	12.2	5.6	49.2
21	297	42.9	150	19.8	395	106	92	90	28.0	11.5	3.8	54.4
22	404	44.0	159	25.0	302	94	108	90	98.6	12.2	5.0	65.5
23	383	58.7	150	28	260	84	98.6	260	58.7	15.0	5.0	50.5
24	541	60.4	250	32	225	74	141	141	41.8	18.2	5.0	38.5
25	920	51.8	274	30	239	67.2	112	86	36.3	15.0	5.6	28.0
26	1,160	49.2	226	28	223	60.4	84	282	32.0	17.4	6.2	23
27	1,041	50.5	174	32	225	60.4	76	196	30.0	15.8	8.0	23
28	676	47.9	110	30	229	53.1	65.5	147	31.0	13.6	15.0	25
29	635	46.6	90	30	-------	51.8	108	101	32.0	15.8	20.6	19
30	1,440	68.9	70.6	32	-------	55.7	94	141	33.0	53.1	10.1	19
31	792	-------	49.2	33	-------	55.7	-------	420	-------	28.0	9.4	-------

*Gage heights affected by ice December 7, 1917 to February 27, 1918.

Estimated Monthly Discharge of Little Shenango River at Greenville, Mercer County.
(Drainage Area 107 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	74	6.2	20.9	0.195	0.225
November	229	17.4	52.3	0.489	0.546
December	336	35.8	92.4	0.864	0.996
January	1,500	45.7	295	2.757	3.179
February	399	28.8	148	1.383	1.440
March	1,272	82.4	287	2.682	3.092
April	556	50.5	145	1.355	1.512
May	450	35.2	132	1.234	1.423
June	1,594	37.4	278	2.598	2.899
July	527	19.8	125	1.168	1.347
August	37.4	14.3	22.8	0.213	0.246
September	41.8	12.9	17.8	0.166	0.185
The year	1,594	6.2	134.6	1.258	17.090

NOTE—Discharge computed from Turnerville December 14, 1916, to March 10, 1917, inclusive, by per cent of drainage area=107/152=70.4%. Ice gorges below gaging station.

Estimated Monthly Discharge of Little Shenango River at Greenville, Mercer County
(Drainage Area 107 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	1,440	17.4	294.7	2.754	3.175
November	285	41.8	76.6	0.716	0.799
December	274	35.2	94.4	0.882	1.017
January	35.2	18.2	28.3	0.264	0.304
February	973	13	324	3.028	3.152
March	1,993	51.8	346	3.234	3.729
April	285	41.8	111.7	1.044	1.165
May	585	36.3	144	1.346	1.552
June	159	28	59.8	0.559	0.624
July	53.1	11.5	18.3	0.171	0.197
August	24	3.8	12.4	0.116	0.134
September	84	7.4	30.9	0.289	0.323
The year	1,993	3.8	127.5	1.192	16.171

NOTES—Gage heights affected by ice December 7, 1917 to February 27, 1918.

OHIO BASIN—STATION NO. 37

PYMATUNING CREEK NEAR ORANGEVILLE

DESCRIPTION OF STATION

Location.—At first highway bridge over Pymatuning Creek above its junction with the Shenango River.

Records Available.—Discharge complete from January 1, 1914, to September 30, 1918.

Drainage Area.—170 square miles.

Gage.—A chain gage, whose elevation of zero is assumed at 100 feet, is located on the upstream side of the bridge and is read by C. I. Mitcheltree.

Channel.—The right bank is high and not subject to overflow; the left overflows at gage height approximately 5.40 feet, and the bed is composed of gravel.

Remarks.—The mill at Orangeville produces some fluctuations in flow particularly at low periods.

Daily Mean Gage Heights, in feet, of Pymatuning Creek near Orangeville, Mercer County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	0.76	0.88	1.83	3.28	-------	-------	1.88	1.14	3.04	1.70	0.92	1.02
2	0.73	0.83	1.87	3.12	-------	-------	2.18	0.99	2.71	1.63	0.90	1.00
3	0.73	0.78	1.71	2.98	-------	-------	2.47	1.04	2.42	1.64	0.84	0.97
4	0.76	0.73	1.60	*	-------	-------	2.36	1.09	2.18	1.61	0.82	0.92
5	0.78	0.78	1.54	-------	-------	-------	2.60	1.47	2.00	1.50	0.82	0.82
6	0.73	0.70	1.50	-------	-------	-------	3.11	1.71	2.04	1.31	0.82	1.56
7	0.78	0.73	1.44	-------	-------	-------	3.42	1.84	2.24	1.10	0.80	1.82
8	0.78	0.76	1.39	-------	-------	-------	3.52	1.92	2.56	1.03	0.80	1.89
9	0.78	0.73	1.34	-------	-------	-------	3.43	1.83	4.11	1.09	0.77	1.81
10	0.78	0.78	1.34	-------	-------	-------	3.27	1.72	6.01	1.49	0.77	1.65
11	0.78	0.78	1.36	-------	-------	-------	2.77	1.55	5.78	1.74	0.77	1.44
12	0.80	0.76	1.32	-------	-------	5.41	2.32	1.36	4.39	2.11	0.77	1.23
13	0.80	0.78	1.31	-------	-------	5.87	1.88	1.24	3.41	2.38	0.74	1.01
14	0.83	0.80	1.42	-------	-------	4.65	1.64	1.14	2.85	3.03	0.87	0.89
15	0.78	0.83	1.28	-------	-------	3.69	1.44	1.04	2.31	3.44	0.80	0.87
16	0.73	0.90	1.12	-------	-------	3.05	1.31	0.99	1.83	3.35	0.77	0.85
17	0.70	0.98	1.09	-------	-------	2.69	1.20	0.94	1.51	3.43	0.74	0.82
18	0.68	0.98	1.05	-------	-------	2.44	1.16	0.96	1.42	3.45	0.72	0.80
19	0.88	0.97	1.01	-------	-------	2.24	1.25	0.99	1.29	2.95	0.72	0.78
20	0.86	0.91	0.99	-------	-------	2.18	1.36	1.02	1.11	2.37	0.74	0.75
21	0.98	0.79	1.06	-------	-------	2.24	1.44	1.36	1.01	2.07	0.72	0.78
22	0.98	0.77	1.08	-------	-------	2.31	1.39	1.69	0.92	1.77	0.74	0.75
23	1.06	0.85	1.16	-------	-------	2.55	1.29	2.07	0.94	1.58	0.77	0.80
24	0.80	1.14	1.18	-------	-------	3.20	1.24	1.87	0.98	1.43	0.77	0.80
25	0.78	1.27	1.22	-------	-------	2.95	1.14	1.73	1.19	1.37	0.77	0.78
26	0.78	1.30	1.23	-------	-------	2.83	1.19	1.69	1.20	1.13	0.72	0.77
27	0.73	1.31	1.84	-------	-------	2.54	1.22	1.74	1.34	1.24	0.92	0.72
28	0.73	1.36	3.18	-------	-------	2.40	1.19	1.94	1.68	1.63	0.92	0.72
29	0.76	1.53	3.33	-------	-------	2.21	1.14	2.35	1.99	1.71	0.84	0.75
30	0.70	1.73	3.25	-------	-------	2.02	1.16	2.60	1.84	1.53	0.84	0.80
31	0.73	-------	3.26	-------	-------	1.89	-------	2.83	-------	1.28	0.92	-------

NOTE—*Ice conditions January 4 to March 11, 1917, inclusive.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	0.78	5.09	1.65	-------	-------	5.97	1.15	1.42	1.92	0.80	0.75	0.72
2	0.73	4.21	1.86	-------	-------	5.32	1.13	1.31	1.63	0.75	0.75	0.70
3	0.79	3.34	1.88	-------	-------	4.62	1.66	1.23	1.46	0.78	0.72	0.72
4	1.00	2.73	1.77	-------	-------	4.24	1.11	1.18	1.31	0.75	0.75	0.75
5	1.22	2.55	1.68	-------	-------	3.83	1.13	1.10	1.38	0.78	0.78	0.75
6	1.36	2.22	*	-------	-------	3.39	1.11	1.10	1.47	0.72	0.78	0.80
7	1.40	1.88	-------	-------	-------	2.90	1.13	1.07	1.53	0.75	0.80	0.78
8	1.37	1.66	-------	-------	-------	2.66	1.15	1.04	1.52	0.75	0.85	0.80
9	1.27	1.53	-------	-------	-------	2.70	1.22	0.99	1.40	0.78	0.85	0.80
10	1.15	1.43	-------	-------	-------	4.09	1.32	1.04	1.33	0.78	0.80	0.78
11	1.04	1.34	-------	-------	-------	4.78	1.57	1.23	1.19	0.75	0.90	0.80
12	1.03	1.30	-------	-------	-------	4.61	1.91	1.68	1.07	0.78	0.85	0.78
13	1.17	1.30	-------	-------	-------	4.51	2.11	2.88	1.00	0.78	0.90	0.75
14	1.29	1.28	-------	-------	-------	6.89	2.15	2.98	1.00	0.70	0.85	0.80
15	1.33	1.24	-------	-------	-------	7.84	2.10	3.18	0.99	0.75	0.85	0.80
16	1.25	1.20	-------	-------	-------	6.39	2.38	3.35	0.92	0.78	0.80	0.85
17	1.19	1.18	-------	-------	-------	4.57	3.02	2.87	0.90	0.78	0.78	1.00
18	1.18	1.20	-------	-------	-------	3.27	2.68	2.25	0.89	0.75	0.75	1.05
19	1.63	1.19	-------	-------	-------	2.65	2.57	1.75	0.84	0.72	0.75	1.05
20	2.58	1.17	-------	-------	-------	2.19	2.40	1.64	0.83	0.72	0.72	1.05
21	2.60	1.16	-------	-------	-------	1.91	2.21	1.42	0.81	0.72	0.75	1.00
22	2.61	1.22	-------	-------	-------	1.71	1.94	1.38	0.86	0.72	0.75	0.95
23	2.86	1.31	-------	-------	-------	1.55	1.81	1.80	0.88	0.78	0.72	0.92
24	3.86	1.36	-------	-------	-------	1.44	1.80	1.99	0.92	0.80	0.72	0.92
25	5.76	1.38	-------	-------	-------	1.37	1.77	1.98	0.97	0.78	0.75	0.90
26	6.43	1.33	-------	-------	-------	1.31	1.67	2.71	0.98	0.78	0.72	0.90
27	5.38	1.27	-------	-------	-------	1.24	1.56	2.86	0.89	0.75	0.72	0.88
28	4.45	1.24	-------	-------	-------	1.21	1.57	2.98	0.83	0.75	0.70	0.90
29	4.18	1.25	-------	-------	-------	1.19	1.75	2.75	0.80	0.75	0.72	0.90
30	5.72	1.36	-------	-------	-------	1.18	1.54	2.50	0.80	0.80	0.75	0.88
31	5.89	-------	-------	-------	-------	1.17	-------	2.35	-------	0.78	0.72	-------

NOTES—*Gage heights affected by ice December 6, 1917 to February 28, 1918.

Daily discharge, in second-feet, of Pymatuning Creek near Orangeville, Mercer County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	10.0	21.7	201	589	*493	*337	213	61	520	171	26.8	41.5
2	8.0	16.1	211	543	*416	*313	289	36.8	429	156	24.2	38.4
3	8.0	11.5	173	503	*324	*263	364	44.6	351	158	17.1	33.8
4	10.0	8.0	149	*376	*281	*212	336	51.6	289	151	15.1	26.8
5	11.5	11.5	136	*954	*224	*150	309	122	243	128	15.1	15.1
6	8.0	6.4	128	*1,720	*167	*115	540	173	253	91	15.1	141
7	11.5	8.0	161	*1,692	*126	*119	631	204	304	54	13.2	139
8	11.5	10.0	106	*1,110	*104	*277	661	223	388	43	13.2	216
9	11.5	8.0	97	*798	*89	*373	634	201	849	51.6	10.7	197
10	11.5	11.5	97	*554	*76	*346	586	176	1,722	126	10.7	160
11	11.5	11.5	100	*394	*70	*787	445	138	1,578	180	10.7	116
12	13.2	10.0	93	*259	*63	1,375	325	100	946	270	10.7	76
13	13.2	11.5	91	*220	*54	1,632	213	78	628	341	8.6	40
14	16.1	13.2	112	*167	*53	1,043	158	61	467	517	20.5	23
15	11.5	16.1	85	*120	*50	714	110	44.6	323	637	13.2	20.5
16	8.0	24.2	57	*109	*47	523	91	36.8	201	610	10.7	18.2
17	6.4	35.3	51.6	*98	*48	423	71	29.5	130	634	8.6	15.1
18	5.5	35.3	46.2	*91	*63	356	64	32.3	112	640	7.4	13.2
19	21.7	33.8	40.0	*82	*87	304	80	36.8	87	495	7.4	11.5
20	19.3	25.5	36.8	*75	*163	289	100	41.5	56	338	8.6	9.3
21	35.3	12.3	47.8	*76	*212	304	116	100	40	260	7.4	11.5
22	35.3	10.7	51.0	*101	*208	323	106	169	26.8	187	8.6	9.3
23	47.8	18.2	64	*148	*226	386	87	260	29.5	145	10.7	13.2
24	13.2	61.0	68	*161	*339	566	78	211	35.3	114	10.7	13.2
25	11.5	84.0	75	*149	*339	495	61	178	69	102	10.7	11.5
26	11.5	89.0	76	*122	*315	461	69	169	71	59	7.4	10.7
27	8.0	91.0	204	*97	*410	383	75	180	97	78	26.8	7.4
28	8.0	100	560	*94	*394	346	69	228	167	156	26.8	7.4
29	10.0	134	604	*100	-------	297	61	333	240	173	17.1	9.3
30	6.4	178	589	*262	-------	248	64	399	204	134	17.1	13.2
31	8.0	-------	583	*445	-------	216	-------	461	-------	85	26.8	-------

NOTE—*Discharge computed from Sharon by per-cent of drainage area = 170/611 = 27.8% Ice gorges below gaging station.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	11.5	1,220	160	85	20.5	1,696	62	112	223	13.2	9.3	7.4
2	8.0	883	208	89	24	1,330	59	91	156	9.3	9.3	6.4
3	12.3	607	213	75	24	1,032	47.8	76	120	11.5	7.4	7.4
4	38.4	434	187	44.6	23	894	56	68	91	9.3	9.3	9.3
5	75	386	167	29.5	20	759	59	54	104	11.5	11.5	9.3
6	100	299	149	28.1	26	622	56	54	122	7.4	11.5	13.2
7	108	213	124	25.5	29	481	59	49.4	134	9.3	13.2	11.5
8	102	162	56	29.5	34	415	62	44.6	132	9.3	18.2	13.2
9	84	134	54	28.1	84	426	75	36.8	108	11.5	18.2	13.2
10	62	114	54	25.5	151	843	93	44.6	95	11.5	13.2	11.5
11	44.6	97	51.6	29.5	222	1,093	143	76	60	9.3	24.2	13.2
12	43	89	51	28.1	446	1,028	220	167	49.4	11.5	18.2	11.5
13	66	89	49.4	24.2	914	991	270	475	38.4	11.5	24.2	9.3
14	87	85	49.4	21.7	1,239	2,538	281	503	38.4	6.4	18.2	13.2
15	95	78	47.8	25.5	1,482	3,099	268	560	36.8	9.3	18.2	13.2
16	80	71	47.8	29.5	1,257	1,975	341	610	26.8	11.5	13.2	18.2
17	69	68	47.8	28.1	944	1,013	515	473	24.2	11.5	11.5	20.4
18	68	71	44.6	25.5	628	586	421	307	23.0	9.3	9.3	46.2
19	156	69	44.6	23.0	753	412	390	182	17.1	7.4	9.3	46.2
20	394	66	54	21.7	1,547	291	346	158	16.1	7.4	7.4	46.2
21	399	64	124	20.5	1,247	220	297	112	14.1	7.4	9.3	38.4
22	402	75	199	19.3	628	173	228	104	19.3	7.4	9.3	30.9
23	473	91	220	18.2	480	138	197	194	21.7	11.5	7.4	26.8
24	768	100	199	18.2	414	116	194	240	26.8	13.2	7.4	26.8
25	1,566	104	351	17.1	357	102	187	238	33.8	11.5	9.3	24.2
26	2,003	95	375	17.1	380	91	164	429	35.3	11.5	7.4	24.2
27	1,360	84	325	17.1	354	78	141	470	23.0	9.3	7.4	21.7
28	968	78	276	17.1	357	73	143	503	16.1	9.3	6.4	24.2
29	873	80	230	16.1	-------	69	182	440	13.2	9.3	7.4	24.2
30	1,542	100	180	18.2	-------	68	136	372	13.2	13.2	9.3	21.7
31	1,644	-------	130	20.5	-------	66	-------	333	-------	11.5	7.4	-------

Estimated Monthly Discharge of Pymatuning Creek near Orangeville, Mercer County.
(Drainage area 170 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	47.8	5.5	13.6	0.080	0.092
November	178	6.4	36.9	0.217	0.242
December	604	36.8	162.6	0.956	1.102
January	1,720	75	394	2.318	2.673
February	493	47	194	1.141	1.188
March	1,632	115	449	2.641	3.045
April	661	61	237	1.394	1.556
May	461	29.5	148	0.871	1.004
June	1,722	26.8	362	2.129	2.376
July	640	43	235	1.382	1.593
August	26.8	7.4	14.1	0.083	0.096
September	216	7.4	50.6	0.298	0.333
The year	1,722	5.5	191.6	1.127	15.300

NOTE: January 4 to March 11, 1917, inclusive, discharge computed from Sharon by percent of drainage area = 170/611 = 27.8% Ice gorges below gaging station.

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	2,003	8	442	2.600	2.998
November	1,226	64	204	1.200	1.339
December	375	44.6	144	0.847	0.977
January	89	16.1	29.5	0.174	0.201
February	1,547	20	503	2.959	3.080
March	3,099	66	726	4.271	4.924
April	515	47.8	190	1.118	1.248
May	610	36.8	244	1.435	1.655
June	223	13.2	61.4	0.361	0.403
July	13.2	6.4	10.1	0.059	0.068
August	24.2	6.4	11.7	0.069	0.080
September	46.2	6.4	20.7	0.122	0.136
The year	3,099	6.4	214	1.260	17.109

NOTES—Gage heights affected by ice December 6, 1917 to February 28, 1918.

OHIO BASIN—STATION NO. 38

SHENANGO RIVER AT SHARON

DESCRIPTION OF STATION

Location.—At single span, steel, through truss, highway bridge at Chestnut Street, Sharon, Mercer County.

Records Available.—Discharge complete from August 1, 1909, to September 30, 1918.

Drainage Area.—611 square miles.

Gage.—A staff gage, whose elevation of zero was 840 feet above mean sea level, was originally fastened to the cribbing on the right bank of the river about 50 feet above the Chestnut Street Bridge. This gage was washed out by high water in March 1913, and gage heights were obtained by measuring to the water surface from a chisel mark on handrail 15 feet from west, or right abutment, upstream side, west end of bridge, whose elevation was 862.57 feet above mean sea level, from March, 1913, to March 31, 1915. On April 1, 1915, a Bristol recording gage, whose elevation of zero is 840 feet above mean sea level, was installed on the bridge.

Channel.—Both banks are approximately 12 feet above the river bed, which is composed of gravel and dirt.

Daily Mean Gage Heights, in feet, of Shenango River at Sharon, Mercer County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.92	2.22	4.04	4.64	5.82	4.96	4.13	2.86	5.44	4.40	2.48	2.64
2	1.93	2.27	3.91	4.56	5.41	4.82	4.59	2.77	5.39	4.24	2.37	2.65
3	1.91	2.29	3.78	4.56	4.88	4.51	5.01	2.66	5.03	4.12	2.32	2.63
4	2.00	2.23	3.62	5.19	4.62	4.17	5.07	2.64	4.50	3.69	2.28	2.60
5	1.99	2.26	3.61	7.79	4.25	3.71	4.96	3.41	4.27	3.39	2.23	2.52
6	1.92	2.13	3.67	10.10	3.84	3.42	5.83	4.19	5.20	3.25	2.15	3.95
7	1.86	2.12	3.47	10.04	3.49	3.45	6.57	4.21	5.93	3.06	2.10	3.53
8	1.84	2.19	3.31	8.35	3.32	4.60	6.47	4.44	5.50	2.96	2.22	3.93
9	1.87	2.25	3.33	7.19	3.17	5.17	6.29	4.30	7.47	2.93	2.20	3.57
10	1.86	2.28	3.57	6.12	3.04	5.01	5.66	4.12	8.47	4.21	2.24	3.31
11	1.94	2.28	3.44	5.29	2.97	6.94	5.09	3.95	8.12	4.47	2.15	3.07
12	1.96	2.33	3.31	4.49	2.89	8.64	4.62	3.63	6.59	4.35	2.11	2.84
13	1.97	2.27	3.24	4.23	2.79	8.58	4.17	3.37	5.66	4.39	2.14	2.62
14	2.06	2.51	2.89	3.84	2.77	7.54	3.83	3.20	5.12	5.50	2.82	2.43
15	2.16	2.56	2.93	3.46	2.73	6.56	3.59	3.02	4.58	6.73	2.60	2.35
16	2.09	2.64	2.95	3.36	2.70	5.67	3.47	2.87	4.12	6.66	2.43	2.28
17	2.16	2.60	2.85	3.26	2.71	5.37	3.29	2.77	3.80	6.25	2.36	2.17
18	2.16	2.50	2.81	3.19	2.89	5.29	3.20	2.70	3.59	5.59	2.22	2.24
19	2.37	2.46	2.77	3.10	3.15	4.87	3.27	2.72	3.39	5.36	2.17	2.16
20	2.63	2.41	2.74	3.03	3.81	4.82	3.52	3.03	3.18	4.47	2.07	2.09
21	2.79	2.48	2.75	3.04	4.17	5.13	3.56	3.66	3.05	4.03	2.37	2.06
22	2.72	2.40	2.75	3.29	4.14	5.09	3.43	3.86	2.97	3.66	2.52	2.12
23	2.60	2.41	2.72	3.69	4.27	5.08	3.33	4.57	3.17	3.66	2.40	2.15
24	2.56	2.81	2.74	3.80	4.97	6.28	3.23	4.45	3.52	3.78	2.44	2.10
25	2.42	3.30	2.83	3.70	4.97	5.92	3.16	4.08	3.55	3.20	2.48	2.04
26	2.40	3.09	2.87	3.48	4.83	5.32	3.20	4.09	3.15	2.94	2.43	2.08
27	2.32	2.98	3.60	3.25	5.38	4.98	3.20	4.14	3.80	2.90	2.48	2.02
28	2.21	3.08	5.82	3.22	5.29	4.72	3.07	4.62	3.93	3.13	2.49	2.00
29	2.26	3.64	6.10	3.28	-------	4.54	2.98	5.59	5.20	3.10	2.41	2.03
30	2.09	4.11	5.27	4.50	-------	4.34	2.91	5.45	4.95	2.92	2.44	2.12
31	2.20	-------	4.75	5.57	-------	4.10	-------	5.22	-------	2.73	2.50	-------

Daily Mean Gage Heights, in feet, of Shenango River at Sharon, Mercer County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917–1918												
1	2.12	7.87	3.75	3.10	2.33	7.47	2.87	3.45	4.59	2.34	2.44	1.99
2	2.23	6.73	4.11	2.91	2.34	7.36	2.86	3.23	3.73	2.29	2.25	1.90
3	2.32	5.83	3.95	2.70	2.33	6.42	2.85	3.14	3.31	2.25	2.20	1.99
4	2.58	5.27	3.84	2.42	2.32	5.86	2.87	3.10	3.06	2.26	2.05	2.03
5	2.87	4.87	3.78	2.29	2.26	5.75	2.84	3.01	3.26	2.30	2.05	2.11
6	2.97	4.53	3.61	2.30	2.37	5.90	2.79	2.93	3.46	2.31	1.95	2.32
7	2.94	4.23	3.39	2.28	2.43	5.75	2.73	2.88	3.40	2.20	1.90	2.44
8	2.86	3.95	3.08	2.38	2.50	5.56	3.05	2.82	3.43	2.13	2.00	2.24
9	2.83	3.72	2.73	2.36	3.12	5.86	3.43	2.78	3.06	2.19	2.00	2.07
10	2.72	3.55	2.84	2.30	3.72	7.34	3.29	2.78	2.93	2.13	2.30	2.07
11	2.60	3.44	2.85	2.36	4.24	7.25	3.41	3.03	2.94	2.10	2.15	2.04
12	2.59	3.36	2.80	2.38	5.57	6.94	4.25	3.36	2.93	2.08	2.11	2.05
13	2.74	3.26	2.74	2.28	7.64	6.95	4.58	5.76	2.74	2.03	2.15	2.11
14	2.80	3.18	2.67	2.30	8.78	9.89	4.42	6.38	2.70	2.05	2.07	2.10
15	2.90	3.12	2.64	2.39	9.49	12.60	4.24	5.73	2.61	2.01	1.99	2.14
16	2.91	3.06	2.67	2.36	8.84	11.14	4.01	5.41	2.71	1.97	1.94	2.20
17	2.83	3.06	2.66	2.35	7.75	8.66	4.94	4.87	2.87	1.95	1.94	2.67
18	2.72	3.02	2.67	2.34	6.47	6.28	5.02	4.32	2.75	1.90	2.03	2.84
19	5.07	3.00	2.65	2.30	7.01	5.31	4.57	3.75	2.60	1.90	1.90	2.62
20	6.07	2.94	2.74	2.26	9.66	4.80	4.29	3.34	2.43	1.85	1.90	2.68
21	5.08	2.92	3.17	2.22	8.81	4.50	4.19	3.41	2.43	1.90	1.82	2.76
22	4.69	2.98	3.91	2.24	6.47	4.07	4.11	3.12	2.43	1.80	1.82	2.69
23	4.79	3.11	4.12	2.31	5.75	3.81	3.95	4.22	2.71	1.80	1.86	2.81
24	7.17	3.23	4.17	2.31	5.40	3.65	4.02	4.18	2.57	1.95	1.82	2.69
25	9.40	3.17	4.78	2.34	5.08	3.50	3.95	4.26	2.60	2.15	1.86	2.58
26	9.21	3.10	4.73	2.28	5.21	3.31	3.71	5.81	2.54	2.30	1.90	2.50
27	8.06	2.99	4.43	2.26	5.06	3.18	3.58	5.80	2.44	2.20	1.82	2.55
28	7.04	2.97	4.26	2.31	5.08	3.04	3.48	5.03	2.46	2.25	1.86	2.50
29	7.12	3.03	3.91	2.27	-------	2.99	3.93	4.54	2.47	2.15	1.94	2.40
30	9.35	3.18	3.61	2.26	-------	2.96	3.84	4.25	2.44	2.70	1.86	2.36
31	9.02	-------	3.38	2.32	-------	2.93	-------	5.22	-------	2.77	1.90	-------

Daily discharge, in second-feet, of Shenango River at Sharon, Mercer County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	28.0	65	696	1,020	1,773	1,211	742	217	1,515	885	117	155
2	28.0	74	633	974	1,496	1,126	991	191	1,482	799	93	158
3	27.0	77	572	974	1,162	946	1,241	161	1,254	736	83	153
4	34.0	67	500	1,354	1,009	762	1,278	155	940	531	76	145
5	33.0	72	495	3,436	804	540	1,211	411	815	403	67	126
6	28.0	52	522	6,180	600	415	1,780	773	1,360	350	54	652
7	25.0	50	436	6,096	444	428	2,340	783	1,852	281	47	461
8	24.0	60	372	3,998	376	997	2,260	907	1,555	248	65	642
9	25.0	73	380	2,870	320	1,341	2,119	831	3,130	239	62	478
10	25.0	76	478	1,990	275	1,241	1,663	736	4,122	783	69	372
11	29.0	76	423	1,418	251	2,647	1,291	652	3,763	924	54	285
12	31.0	85	372	934	226	4,300	1,009	504	2,356	858	48	211
13	32.0	74	346	794	196	4,237	762	395	1,663	889	53	150
14	42.0	123	226	600	191	3,196	595	331	1,310	1,550	205	106
15	56.0	135	239	432	179	2,332	487	268	986	2,470	145	89
16	42.0	155	245	391	171	1,670	436	220	736	2,413	106	76
17	56.0	145	214	353	174	1,470	364	191	581	2,088	91	58
18	56.0	121	202	327	226	1,418	531	171	487	1,615	65	69
19	93.0	112	191	295	313	1,156	357	177	403	1,463	58	56
20	153	101	182	271	586	1,126	457	271	324	924	43	46
21	196	117	185	275	762	1,316	474	517	278	691	93	42
22	177	99	185	364	747	1,291	419	609	251	517	126	50
23	145	101	177	531	815	1,285	380	980	320	517	99	54
24	135	202	182	581	1,217	2,112	342	912	457	572	108	47
25	102	368	208	535	1,217	1,844	317	716	470	331	117	39
26	99.0	292	220	440	1,132	1,437	331	721	313	242	106	44
27	83.0	255	491	350	1,476	1,293	331	727	581	229	117	37
28	64.0	987	1,773	238	1,418	1,067	285	1,009	647	306	110	34
29	72.0	509	1,975	261	-------	963	255	1,615	1,360	295	101	38
30	46.0	731	1,405	940	-------	853	232	1,522	1,204	235	108	50
31	62.0	-------	1,084	1,602	-------	726	-------	1,373	-------	179	121	-------

Daily discharge, in second-feet, of Shenango River at Sharon, Mercer County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1917-1918												
1	50	3,515	558	295	85	3,130	220	428	991	87	108	33
2	67	2,470	731	232	87	3,027	217	342	549	77	70	26
3	83	1,780	652	171	85	2,221	214	309	374	70	62	33
4	140	1,405	600	105	83	1,802	220	295	281	72	40	38
5	220	1,156	572	77	72	1,724	211	264	353	79	40	48
6	251	957	495	79	93	1,830	196	259	432	81	30	83
7	242	794	403	76	106	1,724	179	223	407	63	26	108
8	217	652	287	95	121	1,595	278	205	419	52	34	69
9	208	544	179	91	302	1,802	419	193	281	60	34	43
10	177	470	211	79	544	3,008	364	193	239	52	79	43
11	145	423	214	91	799	2,925	411	271	242	47	54	39
12	143	591	199	95	1,602	2,647	804	391	239	44	48	40
13	182	353	182	76	3,291	2,656	986	1,731	182	38	54	48
14	199	324	163	79	4,452	5,886	896	2,189	171	40	43	47
15	229	302	155	97	5,327	10,380	799	1,711	148	35	33	53
16	232	281	163	91	4,520	7,784	681	1,496	174	32	29	62
17	208	281	161	89	3,398	4,322	1,198	1,156	220	30	29	163
18	177	268	163	87	2,260	2,112	1,247	842	185	26	38	211
19	1,278	261	158	79	2,708	1,430	980	558	145	26	26	150
20	1,953	242	182	72	5,564	1,114	826	384	106	24	26	166
21	1,285	235	320	65	4,486	940	773	411	106	26	24	188
22	1,049	255	633	69	2,260	711	731	302	106	23	24	168
23	1,108	299	736	81	1,724	586	652	789	174	23	25	202
24	2,852	342	762	81	1,489	513	686	768	138	30	24	168
25	5,210	320	1,102	87	1,285	448	652	810	145	54	25	140
26	4,972	295	1,073	76	1,366	372	540	1,766	131	79	26	121
27	3,703	258	902	72	1,272	324	482	1,759	108	62	24	133
28	2,735	251	810	81	1,285	275	440	1,254	112	70	25	121
29	2,806	271	633	74	-------	258	642	963	114	54	29	99
30	5,145	324	495	72	-------	248	600	804	108	171	25	91
31	4,734	-------	399	83	-------	239	-------	1,373	-------	191	26	-------

Estimated Monthly Discharge of Shenango River at Sharon, Mercer County.
(Drainage area 611 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	196	24	66.1	0.108	0.125
November	731	50	158	0.259	0.289
December	1,975	177	504	0.825	0.951
January	6,180	271	1,323	2.165	2.496
February	1,773	171	699	1.144	1.191
March	4,300	415	1,506	2.465	2.842
April	2,340	232	836	1.386	1.527
May	1,615	155	614	1.005	1.159
June	4,122	251	1,217	1.992	2.223
July	2,470	179	792	1,296	1,494
August	205	43	90.8	0.149	0.172
September	652	34	164	0.268	0.299
The year	6,180	24	664.7	1,088	14,768

Estimated Monthly Discharge of Shenango River at Sharon, Mercer County
(Drainage area 611 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1917-1918					
October	5,210	50	1,355	2.218	2.557
November	3,515	235	657	1.075	1.200
December	1,102	155	461	0.755	0.871
January	295	65	96.6	0.158	0.182
February	5,564	72	1,810	2.962	3.083
March	10,380	239	2,195	3.592	4.142
April	1,247	179	585	0.957	1.068
May	2,189	193	788	1.290	1.487
June	991	106	246	0.403	0.450
July	191	23	58.6	0.096	0.111
August	108	24	38.1	0.062	0.071
September	211	26	97.8	0.160	0.179
The year	10,380	23	693	1.134	15.041

OHIO BASIN—STATION NO. 39

SHENANGO RIVER AT NEW CASTLE

DESCRIPTION OF STATION

Location.—At West Washington Street Bridge over Shenango River at New Castle, Lawrence County.

Records Available.—Discharge complete from January 1, 1910, to September 30, 1918.

Drainage Area.—797 square miles.

Gage.—A chain gage, whose elevation of zero is 787.00 feet above mean sea level, is located on the bridge and is read by J. L. Moseley.

Channel.—The right bank is high and not subject to overflow; the left is high and overflows only during extreme floods, and the bed is composed of rock and gravel.

Daily Mean Gage Heights, in feet, of Shenango River at New Castle, Lawrence County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	788.18	788.37	*790.01	790.40	791.48	790.65	789.94	788.92	791.15	790.28	788.77	788.50
2	88.10	88.37	89.88	90.29	91.18	90.50	90.19	88.87	91.03	90.27	88.5	88.75
3	88.10	88.47	89.67	90.37	90.55	90.30	90.57	88.81	90.51	89.93	88.49	88.59
4	88.08	88.50	89.54	90.91	90.20	90.10	90.55	88.86	90.16	89.62	88.45	88.61
5	88.10	88.50	89.47	92.71	90.02	89.78	90.57	89.35	90.37	89.38	88.36	88.64
6	88.15	88.49	89.57	94.51	89.85	89.42	91.10	89.87	92.61	89.24	88.34	89.18
7	88.15	88.40	89.47	94.99	89.59	89.41	92.24	90.07	92.77	89.11	88.41	90.31
8	88.11	88.34	89.28	94.35	89.27	90.23	91.93	90.13	91.79	88.94	88.40	90.20
9	88.12	88.44	89.23	92.90	89.19	91.04	91.71	90.12	91.91	88.92	88.42	89.68
10	88.19	88.46	89.36	91.85	89.10	90.85	91.29	89.90	93.40	89.90	88.41	89.24
11	88.15	88.50	89.42	91.10	89.06	91.74	90.79	89.66	93.61	90.04	88.39	89.05
12	88.16	88.54	89.31	90.46	88.96	93.50	90.36	89.50	92.60	90.16	88.35	88.91
13	88.19	88.56	89.23	90.23	88.86	93.78	90.05	89.28	91.35	90.01	88.35	88.75
14	88.32	88.66	89.12	89.72	88.85	93.30	89.75	89.14	90.83	90.03	88.49	88.62
15	88.31	88.75	88.93	89.39	88.85	92.40	89.53	89.00	90.40	90.63	88.81	88.50
16	88.25	88.72	88.89	89.57	88.85	91.52	89.40	88.87	90.02	91.55	88.68	88.50
17	88.39	88.75	88.88	89.49	88.86	91.07	89.32	88.79	89.76	92.72	88.60	88.45
18	88.37	88.76	88.85	89.28	88.95	90.85	89.22	88.75	89.48	92.15	88.50	88.33
19	88.59	88.75	88.86	89.24	89.17	90.65	89.17	88.75	89.30	91.38	88.43	88.30
20	88.80	88.68	88.83	89.09	89.64	90.60	89.31	88.76	89.21	90.54	88.33	88.21
21	88.90	88.63	88.84	89.07	90.01	90.72	89.43	89.02	89.08	89.94	88.32	88.19
22	88.88	88.67	88.88	89.24	89.99	90.85	89.30	89.53	88.98	89.83	88.35	88.20
23	88.85	88.70	88.84	89.58	90.04	90.69	89.21	90.09	88.98	89.47	88.60	88.20
24	88.80	88.83	88.86	89.78	90.50	91.70	89.11	90.33	89.48	89.41	88.60	88.19
25	88.71	89.14	88.80	89.70	90.53	91.80	89.03	89.93	89.29	89.20	88.48	88.19
26	88.69	89.27	88.89	89.54	90.51	91.02	89.09	89.74	89.26	89.15	88.50	88.20
27	88.57	89.09	89.40	89.31	90.91	90.68	89.15	89.72	89.23	89.06	88.55	88.20
28	88.48	89.12	91.23	89.22	91.01	90.52	89.17	90.01	89.76	89.03	88.55	88.21
29	88.39	89.35	91.71	89.75	-------	90.38	89.02	90.73	90.26	89.09	88.59	88.21
30	88.27	89.93	91.24	90.30	-------	90.20	88.94	91.00	90.70	89.07	88.57	88.22
31	88.40	-------	90.60	91.25	-------	89.98	-------	90.76	-------	88.91	88.53	-------
1917-1918												
1	788.21	793.70	789.52	789.36	-------	793.29	788.98	789.72	790.68	788.58	788.55	788.10
2	88.29	92.56	89.95	89.12	-------	93.66	88.98	89.50	90.25	88.46	88.51	88.10
3	88.28	91.32	89.76	*	-------	92.60	89.05	89.21	89.50	88.42	88.45	88.10
4	88.52	90.73	89.65	-------	-------	91.75	89.10	89.10	89.31	88.30	88.45	88.18
5	88.78	90.55	89.60	-------	-------	91.39	89.03	88.98	90.46	88.30	88.42	88.21
6	88.84	90.29	89.58	-------	-------	91.61	88.98	88.94	89.70	88.30	88.30	88.20
7	88.86	90.06	89.38	-------	-------	91.57	88.95	88.82	89.65	88.35	88.22	88.20
8	88.90	89.77	89.22	-------	-------	91.17	89.10	88.78	89.85	88.32	88.40	88.40
9	88.90	89.59	88.85	-------	88.86	91.26	89.50	88.70	89.68	88.31	88.40	88.40
10	88.87	89.48	88.85	-------	90.31	92.89	89.55	88.72	89.30	88.30	88.40	88.40
11	88.73	89.38	88.85	-------	90.45	93.13	89.50	88.82	89.10	88.29	88.45	88.31
12	88.64	89.31	88.84	-------	91.31	92.45	90.10	89.27	89.00	88.25	88.62	88.30
13	88.63	89.24	88.81	-------	93.36	92.14	90.92	90.85	88.99	88.25	88.48	88.30
14	88.64	89.17	88.80	-------	93.58	93.83	90.85	92.30	88.95	88.18	88.38	88.25
15	88.82	89.11	88.20	-------	94.26	95.94	90.28	91.35	88.88	88.08	88.37	88.25
16	88.91	89.07	88.80	-------	94.47	96.88	90.05	91.02	88.80	88.05	88.30	88.20
17	88.99	89.00	88.80	-------	93.42	95.02	90.75	90.79	88.80	88.05	88.30	88.75
18	88.85	89.00	88.80	-------	91.90	92.48	91.30	90.12	88.82	88.04	88.20	88.85
19	89.92	88.99	88.80	-------	91.70	91.14	90.64	89.85	88.79	88.03	88.18	88.90
20	91.91	88.97	88.89	-------	94.49	90.60	90.12	89.52	88.68	88.02	88.10	88.82
21	91.01	88.94	89.20	-------	94.65	90.28	90.00	89.40	88.50	88.02	88.10	88.82
22	90.35	88.94	89.98	-------	92.84	90.02	89.98	89.82	89.05	88.01	88.09	88.90
23	90.35	89.10	90.20	-------	91.55	89.78	89.85	90.36	88.98	88.00	88.06	88.80
24	91.89	89.22	90.21	-------	91.05	89.60	89.94	90.43	88.94	88.00	88.02	88.85
25	94.36	89.18	90.62	-------	90.81	89.50	89.94	90.16	88.72	88.10	88.00	88.75
26	94.53	89.10	90.58	-------	90.91	89.35	89.68	91.80	88.66	88.02	88.00	88.70
27	93.84	89.07	90.52	-------	90.86	89.21	89.42	91.70	88.60	88.35	87.96	88.64
28	93.00	89.00	90.35	-------	90.74	89.20	89.30	91.18	88.52	88.10	87.95	88.60
29	92.20	89.03	89.99	-------	-------	89.15	89.80	90.56	88.50	88.40	88.10	88.55
30	93.71	89.11	89.76	-------	-------	89.00	89.98	90.52	88.50	88.40	88.12	88.50
31	94.29	-------	89.50	-------	-------	89.00	-------	90.68	-------	88.55	88.12	-------

NOTES—*Gage heights affected by ice January 3, to February 8, 1918.

Daily discharge, in second-feet, of Shenango River at New Castle, Lawrence County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	46.3	85.8	973	1,288	2,359	1,512	920	285	2,012	1,188	219	120
2	33.1	85.8	874	1,196	2,044	1,374	1,114	262	1,886	1,130	150	136
3	33.1	112	729	1,262	1,420	1,204	1,438	235	1,383	912	117	150
4	30.2	120	645	1,764	1,122	1,042	1,420	257	1,090	696	106	157
5	33.1	120	601	3,854	980	803	1,438	534	1,262	543	83.4	168
6	41.0	117	664	6,712	852	569	1,960	867	3,714	456	78.8	420
7	41.0	93.2	601	7,586	677	562	3,233	1,019	3,942	382	95.7	1,212
8	34.6	78.8	481	6,432	474	1,147	2,864	1,066	2,704	294	93.2	1,122
9	36.1	104	450	4,130	426	1,897	2,612	1,058	2,842	285	98.3	736
10	48.1	109	531	2,772	376	1,705	2,160	889	4,865	889	95.7	456
11	41.0	120	569	1,960	255	2,646	1,646	723	5,196	996	90.7	350
12	41.0	133	499	1,340	304	5,020	1,254	620	3,700	1,090	81.0	280
13	48.1	140	450	1,147	257	5,472	1,004	481	2,222	973	81.0	210
14	74.2	175	387	762	253	4,715	782	398	1,865	988	117	160
15	72.1	210	289	550	253	3,430	639	323	1,288	1,494	235	120
16	59.5	198	271	664	253	2,402	556	262	980	2,435	183	120
17	90.7	210	266	614	257	1,928	506	227	789	3,869	153	106
18	85.8	215	253	481	299	1,705	443	210	607	3,125	120	76.5
19	150	210	257	456	414	1,512	414	210	493	2,254	101	70.0
20	231	183	244	371	709	1,465	499	215	437	1,410	76.5	51.9
21	275	164	249	360	973	1,579	575	334	365	920	74.2	48.1
22	266	179	266	456	957	1,705	493	639	313	838	81.0	50.0
23	253	190	249	670	996	1,550	437	1,034	313	601	153	50.0
24	231	244	257	803	1,374	2,600	382	1,229	607	562	153	48.1
25	194	398	271	749	1,401	2,715	339	912	550	493	114	48.1
26	186	474	271	645	1,383	1,876	371	776	468	404	120	50.0
27	143	371	556	499	1,764	1,541	404	762	450	355	136	50.0
28	114	387	2,096	443	1,866	1,392	414	973	789	339	136	51.9
29	90.7	524	2,612	462	-------	1,271	334	1,589	1,171	371	150	51.9
30	63.5	912	2,107	1,204	-------	1,122	294	1,855	1,560	360	143	53.8
31	93.2	-------	1,465	2,118	-------	950	-------	1,618	-------	280	130	-------
1917-1918												
1	52	5,340	633	531	111	4,700	313	762	1,541	146	136	33
2	50	3,644	927	387	113	5,276	313	620	1,163	93	123	33
3	65	2,191	789	224	111	3,700	350	437	620	98	106	33
4	127	1,589	716	134	108	2,658	376	376	499	70	106	46
5	223	1,420	683	102	93	2,264	339	313	1,340	70	98	52
6	249	1,196	670	110	103	2,501	313	294	749	70	70	50
7	257	1,011	543	99	138	2,457	299	240	716	81	54	50
8	275	796	443	124	158	2,034	376	223	852	74	93	93
9	275	677	253	118	257	2,128	620	190	736	72	93	93
10	262	607	253	103	1,212	4,116	652	198	493	70	93	93
11	202	543	253	118	1,331	4,464	620	240	376	68	106	72
12	168	499	249	124	2,180	3,495	1,042	474	323	60	160	70
13	164	456	235	99	4,805	3,113	1,774	1,705	318	60	114	70
14	168	414	231	103	5,148	5,554	1,705	3,305	299	46	88	60
15	240	382	231	127	6,275	9,464	1,188	2,222	266	30	81	60
16	280	360	231	118	6,642	11,466	1,004	1,876	231	26	70	70
17	285	323	231	116	4,896	7,642	1,608	1,646	231	26	70	210
18	253	323	231	113	2,830	5,534	2,170	1,058	240	25	50	253
19	904	318	231	103	2,600	2,002	1,503	852	227	23	46	275
20	2,830	309	271	93	6,678	1,465	1,058	633	183	22	33	240
21	1,866	294	431	84	6,960	1,188	965	556	120	22	33	240
22	1,246	294	950	90	4,043	980	950	831	350	21	32	275
23	1,246	376	1,122	106	2,435	803	859	1,254	313	26	27	231
24	2,818	443	1,130	106	1,908	683	920	1,314	294	20	22	253
25	6,450	420	1,484	113	1,666	620	920	1,090	198	33	20	210
26	6,748	376	1,447	99	1,764	524	736	2,715	175	160	20	190
27	5,571	360	1,392	93	1,715	437	569	2,600	153	81	16	168
28	4,228	338	1,240	106	1,590	481	492	2,044	127	33	15	153
29	3,293	334	904	96	-------	404	816	1,374	120	93	33	136
30	5,356	382	789	93	-------	323	950	1,392	120	93	36	120
31	6,328	-------	620	108	-------	323	-------	1,541	-------	136	36	-------

Estimated Monthly Discharge of Shenango River at New Castle, Lawrence County.
(Drainage area 797 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October,	275	30.2	103	0.129	0.149
November,	912	78.8	222	0.278	0.310
December,	2,612	244	659	0.826	0.952
January,	7,506	300	1,734	2,175	2,508
February,	2,359	253	886	1.111	1.157
March,	5,472	562	1,949	2.444	2.818
April,	3,233	294	1,032	1.294	1.414
May,	1,855	210	705	0.884	1.091
June,	5,196	313	1,662	2.084	2.326
July,	3,860	280	998	1.252	1.444
August,	235	74.2	121	0.152	0.175
September,	1,212	48.1	224	0.281	0.314
The year,	7,586	30.2	858.4	1.076	14.516
1917-1918					
October	6,748	50	1,694	2.125	2.450
November	5,340	294	867	1.088	1.214
December	1,484	231	639	0.802	0.925
January	531	84	134	0.168	0.194
February	6,960	93	2,424	3.041	3.166
March	11,466	323	2,927	3.673	4.235
April	2,170	299	860	1.079	1.204
May	3,305	190	1,109	1.391	1.604
June	1,541	120	446	0.560	0.625
July	160	20	62.6	0.079	0.091
August	136	15	67.1	0.084	0.097
September	275	33	131	0.164	0.183
The year	11,466	15	939	1.178	15.988

NOTES—Gage heights affected by ice January 3 to February 8, 1918.

OHIO BASIN—STATION NO. 40

MAHONING RIVER NEAR NEW CASTLE

DESCRIPTION OF STATION

Location.—At Borough Line Bridge, which is the first highway bridge above the mouth of the river.

Records Available.—Discharge measurements from March 10, 1914, and discharge complete from August 12, 1914, to September 30, 1918.

Drainage Area.—1,070 square miles.

Gage.—A chain gage, whose elevation of zero is 760.00 feet, New Castle City datum, is located on the downstream side of the bridge and is read by W. A. Wallace.

Channel.—Both banks overflow at gage height approximately 11 feet, and the bed is composed of sand and gravel.

Remarks.—Data at this station to October 1, 1914, has been published under Mahoning River at Lawrence Junction, Lawrence County.

Daily Mean Gage Heights, in feet, of Mahoning River near New Castle, Lawrence County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	2.01	2.01	2.90	4.22	7.87	6.62	4.17	3.35	5.50	3.88	3.06	3.15
2	2.13	2.24	3.43	4.13	7.19	5.62	4.00	3.59	6.65	3.71	2.70	3.17
3	2.01	2.50	3.44	4.27	5.24	4.74	4.41	3.77	5.95	3.83	2.60	3.22
4	2.04	1.88	3.37	4.88	4.43	4.50	5.00	3.40	4.96	3.77	2.50	3.17
5	1.84	1.93	3.37	8.71	4.11	4.12	4.92	3.45	4.96	3.22	2.40	3.15
6	1.67	2.31	3.10	11.09	4.48	4.02	6.04	4.09	8.47	3.47	2.60	4.21
7	1.60	2.39	3.37	10.77	3.97	4.11	8.20	5.03	10.12	3.13	2.80	4.51
8	1.50	2.24	3.41	9.36	3.72	4.56	8.88	4.75	9.44	2.74	2.97	3.80
9	1.84	2.31	3.44	8.57	3.37	5.99	7.30	4.40	8.84	3.04	2.87	3.19
10	1.89	2.38	3.32	7.78	3.26	6.12	5.82	4.20	9.37	4.67	2.96	3.49
11	1.94	2.54	3.35	5.73	3.18	7.49	5.19	4.16	9.04	4.33	2.81	3.35
12	1.73	2.38	3.39	4.79	3.13	9.45	4.02	4.00	8.34	3.49	3.18	3.26
13	1.65	2.17	3.39	4.05	3.10	9.22	3.97	3.70	6.82	3.60	3.00	3.27
14	1.65	2.04	3.12	3.97	3.02	8.33	3.96	3.66	5.18	3.55	2.90	3.30
15	1.62	2.94	2.75	3.34	2.94	7.42	3.94	3.25	4.79	6.06	3.81	3.46
16	1.62	2.70	2.60	3.00	2.73	6.21	3.83	2.85	4.32	5.02	3.69	3.26
17	1.62	2.64	2.63	2.91	2.52	5.64	3.62	3.06	4.02	4.96	3.13	3.27
18	1.50	2.71	2.65	3.32	2.30	5.10	3.55	3.03	3.86	5.25	3.04	3.27
19	1.55	2.54	2.65	2.99	3.40	4.90	3.63	3.00	3.70	4.82	3.00	3.29
20	1.85	2.51	2.50	3.23	3.82	4.59	3.74	2.93	3.56	5.68	3.04	3.24
21	3.47	2.18	2.49	2.95	4.53	4.44	3.85	2.97	3.08	4.76	3.01	3.14
22	3.77	2.46	2.59	3.16	4.60	4.37	3.81	3.24	2.90	4.03	3.29	3.05
23	3.35	2.13	2.55	3.20	4.65	4.65	3.66	3.67	2.84	3.84	3.81	3.06
24	2.95	2.38	2.72	4.26	4.67	4.93	3.60	4.20	3.71	3.77	3.98	3.09
25	2.68	3.26	2.74	4.52	5.67	7.42	3.44	4.05	4.27	3.71	3.83	3.10
26	2.59	3.58	3.64	4.61	5.24	6.78	3.41	3.89	3.84	3.46	3.83	3.14
27	2.55	3.52	4.14	4.49	5.98	5.64	3.58	3.44	3.68	3.99	3.20	3.20
28	2.43	2.92	5.09	4.17	6.86	4.89	3.76	2.91	3.30	3.02	3.16	3.23
29	2.28	2.80	5.63	3.84	-------	4.47	3.74	2.81	3.71	3.66	3.07	3.10
30	2.36	2.71	5.69	4.62	-------	4.47	3.39	5.58	3.84	3.52	2.98	2.93
31	1.96	-------	5.36	6.88	-------	4.45	-------	5.52	-------	3.50	3.03	-------
1917-1918												
1	3.46	8.45	4.74	3.48	4.18	9.74	3.16	4.31	6.82	2.88	2.95	2.62
2	3.49	7.32	3.83	3.36	5.20	9.41	3.15	4.00	6.12	2.71	2.92	2.60
3	3.63	5.82	3.96	3.10	5.02	7.01	3.48	3.78	4.85	2.80	2.85	2.58
4	3.89	5.05	3.93	3.18	4.25	6.25	3.45	3.55	4.15	2.80	2.85	2.75
5	3.70	4.62	3.87	3.08	3.60	5.81	3.40	3.28	4.84	2.70	2.70	2.80
6	3.57	4.24	3.65	3.07	3.12	5.93	3.20	3.23	5.08	2.65	2.48	2.95
7	3.50	4.13	3.55	3.19	3.12	6.06	3.12	3.20	4.98	2.64	2.82	2.82
8	3.48	3.97	3.28	3.19	3.25	5.67	3.60	3.17	4.80	2.75	4.22	2.70
9	3.57	3.82	3.20	3.25	4.91	5.63	3.60	3.15	4.45	2.66	3.68	2.68
10	3.44	3.68	2.98	3.12	5.78	8.38	3.55	3.13	3.90	2.70	3.50	2.58
11	3.35	3.50	2.84	3.05	6.25	8.12	3.68	3.12	3.40	2.73	3.51	2.62
12	3.53	3.42	3.00	3.17	7.58	7.00	3.96	3.45	3.39	2.68	3.51	2.50
13	3.53	3.42	2.85	3.17	9.75	6.96	5.56	5.25	3.22	2.48	3.52	2.95
14	3.57	3.50	2.96	3.28	8.92	9.96	5.84	7.70	2.89	2.50	3.61	2.75
15	3.61	3.60	2.85	3.35	9.95	11.35	5.25	6.82	2.85	2.64	3.42	3.04
16	3.79	3.59	2.90	3.00	8.27	10.55	4.58	5.55	2.80	2.62	3.10	2.85
17	4.04	3.32	2.93	3.06	7.45	7.48	6.10	4.88	2.66	2.90	2.82	3.30
18	4.10	3.16	2.88	3.15	5.81	6.08	6.65	4.32	2.65	2.82	2.75	2.96
19	6.18	3.15	3.05	2.98	6.45	5.68	6.05	3.95	2.45	2.86	2.45	3.04
20	7.18	3.05	3.05	2.96	10.86	5.32	5.15	3.65	2.41	2.58	2.35	3.10
21	6.14	3.13	3.77	3.02	9.93	5.05	5.85	3.60	2.51	2.78	2.48	3.40
22	5.38	3.32	4.69	2.98	8.00	4.14	4.70	3.66	3.71	2.98	2.50	2.92
23	5.31	3.16	4.88	3.00	6.66	3.88	4.77	4.69	3.40	2.68	2.50	2.82
24	9.50	3.43	4.86	3.08	6.40	3.61	4.78	4.15	3.45	2.98	2.62	2.71
25	10.70	3.74	5.15	3.10	6.12	3.61	4.70	4.45	3.41	2.98	2.52	2.78
26	9.10	3.55	4.96	3.49	5.87	3.46	4.58	5.79	3.10	3.05	2.52	2.70
27	8.26	3.40	4.80	4.20	5.78	3.32	4.22	6.05	2.98	2.92	2.50	2.70
28	7.55	3.36	4.27	4.20	6.20	3.28	3.98	6.25	3.05	2.94	2.65	2.62
29	9.00	3.13	3.98	4.04	-------	3.21	4.95	5.20	2.86	2.90	2.82	2.60
30	9.30	3.22	3.70	4.20	-------	3.20	4.78	6.40	2.75	3.00	2.65	2.60
31	8.85	-------	3.57	4.13	-------	3.25	-------	6.48	-------	3.07	2.85	-------

Daily discharge, in second-feet, of Mahoning River near New Castle, Lawrence County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916–1917												
1	58	58	162	586	3,691	2,324	560	255	1,385	421	194	212
2	68	79	274	540	2,890	1,476	475	315	2,352	354	131	216
3	58	106	276	614	1,208	876	690	374	1,740	398	118	226
4	60	48	259	967	702	740	1,045	266	1,019	374	106	216
5	45	55	259	4,995	530	540	993	279	1,019	226	95	212
6	33	86	202	10,783	729	485	1,812	844	4,498	279	118	580
7	29	94	259	9,990	462	530	4,150	1,064	8,377	208	145	746
8	23	79	269	6,498	357	778	5,335	882	6,691	137	176	385
9	45	86	276	4,732	259	1,772	3,010	685	5,255	190	157	220
10	48	93	248	3,576	235	1,877	1,636	575	6,518	834	174	289
11	52	111	255	1,564	218	3,228	1,168	555	5,699	646	147	255
12	37	93	264	908	208	6,716	485	475	4,360	289	218	235
13	32	72	264	500	202	6,145	462	350	2,520	318	182	237
14	32	60	206	462	186	4,345	457	337	1,162	305	162	244
15	30	170	138	253	170	3,148	448	233	908	1,828	390	235
16	30	131	118	182	135	1,954	398	154	641	1,058	347	235
17	30	123	122	164	108	1,492	324	194	485	1,019	208	237
18	23	132	124	248	85	1,110	305	188	412	1,210	190	237
19	26	111	124	180	266	980	328	182	350	928	182	242
20	45	107	106	229	394	790	364	168	308	1,524	190	231
21	284	73	105	172	756	707	408	176	198	889	184	210
22	374	102	117	214	795	668	390	231	162	490	242	192
23	255	68	112	222	822	822	337	340	152	403	390	194
24	172	93	134	608	834	1,000	318	575	354	374	466	200
25	128	235	137	751	1,516	3,148	276	500	614	354	398	202
26	117	313	331	800	1,203	2,480	269	426	403	282	398	210
27	112	297	545	734	1,764	1,492	313	276	344	470	222	222
28	98	166	1,104	560	2,560	974	371	164	244	186	214	229
29	83	145	1,484	403	-------	724	364	147	354	337	196	202
30	91	132	1,532	806	-------	724	264	1,445	403	297	178	168
31	54	-------	1,287	2,580	-------	712	-------	1,400	-------	292	188	-------
1917-1918												
1	282	4,530	876	287	565	7,435	214	636	2,520	159	172	121
2	289	3,033	398	257	1,175	6,617	212	475	1,877	132	166	118
3	328	1,636	457	202	1,058	2,710	287	378	948	145	154	116
4	426	1,078	444	218	602	1,988	279	305	550	145	154	138
5	360	806	416	198	318	1,628	266	240	941	131	131	145
6	310	597	334	196	206	1,724	222	229	1,097	124	104	172
7	292	540	305	220	206	1,828	206	222	1,032	123	148	148
8	287	462	240	220	233	1,516	318	216	915	138	586	131
9	310	394	222	233	986	1,484	318	212	712	126	344	128
10	276	344	178	206	1,604	4,420	305	208	430	131	292	116
11	255	292	152	192	1,988	4,030	344	206	266	135	295	121
12	300	271	182	216	3,336	2,700	457	279	264	128	295	106
13	300	271	154	216	7,460	2,660	1,480	1,210	226	104	297	172
14	310	292	174	240	5,420	7,981	1,652	3,480	160	106	321	138
15	321	318	154	255	7,956	11,428	1,210	2,520	154	123	271	190
16	382	315	162	182	4,255	9,444	784	1,422	145	121	202	154
17	495	248	168	194	3,182	3,217	1,860	967	126	162	148	244
18	525	214	159	212	1,628	1,844	2,352	641	124	148	138	174
19	1,928	212	192	178	2,165	1,524	1,820	452	100	155	100	190
20	2,880	192	192	174	10,213	1,259	1,142	334	96	116	90	202
21	1,896	208	374	186	7,906	1,078	1,660	318	107	142	104	266
22	1,301	248	844	178	3,860	545	850	337	354	178	106	166
23	1,252	214	967	182	2,362	421	896	844	266	128	106	148
24	6,840	274	954	198	2,120	321	902	550	279	178	121	132
25	9,816	364	1,168	202	1,877	321	850	712	269	178	108	142
26	5,848	305	1,019	280	1,676	282	784	1,556	202	192	108	131
27	4,240	266	915	575	1,604	248	586	1,820	178	166	106	131
28	3,300	257	614	575	1,945	240	466	1,988	192	170	124	121
29	5,600	208	466	495	-------	224	452	1,175	155	162	148	118
30	6,344	226	350	575	-------	222	378	2,120	138	182	124	118
31	5,275	-------	310	540	-------	233	-------	2,192	-------	196	154	-------

Estimated Monthly Discharge of Mahoning River near New Castle, Lawrence County.
(Drainage area 1,070 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	374	23	83.0	0.078	0.090
November	313	48	117	0.109	0.122
December	1,532	105	358	0.335	0.386
January	10,783	164	1,801	1.683	1.940
February	3,691	85	831	0.777	0.809
March	6,716	485	1,766	1.650	1.902
April	5,335	264	925	0.864	0.964
May	1,445	147	453	0.423	0.488
June	8,377	152	1,934	1.806	2.049
July	1,828	137	546	0.510	0.588
August	466	95	216	0.202	0.233
September	746	108	257	0.240	0.268
The year	10,783	23	776	0.725	9.839
1917-1918					
October	9,816	255	2,018	1.886	2.175
November	4,530	192	620	0.579	0.646
December	1,168	152	437	0.408	0.470
January	575	174	268	0.250	0.288
February	10,213	206	2,782	2.600	2.707
March	11,428	222	2,631	2.459	2.835
April	2,352	206	783	0.732	0.817
May	3,480	206	911	0.851	0.981
June	2,520	96	494	0.462	0.516
July	196	104	146	0.136	0.157
August	536	90	184	0.172	0.198
September	266	106	150	0.140	0.156
The year	11,428	90	942	0.880	11.946

OHIO BASIN—STATION NO. 41

BEAVER RIVER AT NEWPORT, LAWRENCE COUNTY.

DESCRIPTION OF STATION

Location.—At abandoned highway bridge at Newport, one mile north of Wampun.

Records Available.—Discharge complete from October 1, 1914, to September 30, 1918.

Drainage Area.—2,125 square miles.

Gage.—A standard chain gage, whose elevation of zero is 737.08 feet above mean sea level, is located on the downstream side of the bridge and is read by Samuel Truby.

Channel.—The right bank is high and not subject to overflow; the left is subject to overflow at elevation 750.6 feet, and the bed is composed of sand and gravel.

Daily Mean Gage Heights, in feet, of Beaver River at Newport, Lawrence County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	1.45	1.63	3.71	4.74	8.01	6.40	4.47	2.84	6.62	5.12	2.66	2.15
2	1.40	1.70	3.76	4.56	7.34	5.72	4.62	2.84	6.92	4.78	2.27	2.20
3	1.35	1.86	3.48	4.82	5.73	4.90	5.23	2.83	6.02	4.32	2.11	2.24
4	1.30	1.81	3.30	5.86	4.84	4.51	5.45	2.82	5.05	3.88	2.05	2.20
5	1.30	1.81	3.23	10.01	4.33	3.98	5.43	3.82	5.32	3.34	2.00	2.12
6	1.27	1.86	3.21	13.16	4.32	3.52	6.41	4.96	9.82	3.15	1.97	4.43
7	1.24	1.79	3.22	12.81	3.75	3.59	8.85	5.22	11.56	2.92	2.10	5.06
8	1.15	1.63	3.07	10.87	3.24	5.21	9.08	5.10	9.93	2.66	2.20	4.27
9	1.22	1.67	2.98	9.10	2.96	6.54	7.69	4.73	9.24	2.74	2.28	4.07
10	1.34	1.89	3.07	7.91	2.78	6.45	6.54	4.33	10.62	5.50	2.26	3.63
11	1.35	1.97	3.14	6.19	2.69	8.02	5.72	4.02	10.26	5.32	2.18	3.36
12	1.22	1.90	3.01	5.01	2.56	10.81	4.69	3.70	8.84	4.60	2.23	2.86
13	1.26	1.85	2.92	4.38	2.46	10.67	4.36	3.30	7.05	4.70	2.00	2.62
14	1.47	2.00	2.76	3.80	2.45	9.44	3.99	3.13	5.89	4.94	2.60	2.46
15	1.59	2.38	2.48	3.16	2.46	8.26	3.73	2.82	5.16	6.94	2.97	2.30
16	1.48	2.35	2.36	3.11	2.36	6.94	3.51	2.59	4.51	7.27	2.66	2.12
17	1.50	2.28	2.38	3.12	2.34	6.33	3.36	2.54	4.06	7.89	2.24	2.02
18	1.46	2.25	2.32	3.05	2.63	6.01	3.20	2.47	3.65	7.10	2.10	2.11
19	1.99	2.20	2.20	2.92	3.16	5.63	3.31	2.48	3.40	6.40	1.96	2.10
20	2.80	2.10	2.17	2.88	4.09	5.37	3.55	2.44	3.35	5.77	1.97	2.04
21	2.96	1.97	2.23	2.87	4.68	5.41	3.67	2.41	3.12	4.80	1.95	1.96
22	2.82	2.06	2.28	3.37	4.73	5.46	3.50	3.35	2.88	4.19	2.19	1.91
23	2.55	2.09	2.30	4.00	4.62	5.42	3.27	4.56	2.75	3.82	3.40	1.91
24	2.37	2.55	2.35	4.42	5.39	6.95	3.10	4.84	3.83	3.62	3.42	1.83
25	2.21	2.97	2.43	4.40	5.95	8.04	2.94	4.33	4.20	3.45	2.91	1.77
26	1.95	3.16	2.86	4.23	5.69	6.98	3.02	3.96	3.76	3.30	2.50	1.95
27	1.97	2.93	3.85	3.89	6.36	5.98	3.20	3.72	3.80	3.65	2.29	1.98
28	1.83	2.81	6.65	3.60	6.85	5.46	3.23	3.84	3.95	3.24	2.27	2.00
29	1.70	3.01	6.92	3.48	-------	5.13	3.06	4.57	5.08	3.25	2.23	1.92
30	1.62	3.33	6.42	5.42	-------	5.03	2.84	6.11	5.79	3.10	2.22	1.83
31	1.65	-------	5.68	7.31	-------	4.68	-------	5.95	-------	2.97	2.14	-------
1917-1918												
1	1.86	9.63	3.60	2.98	3.15	12.28	2.82	4.50	7.18	2.00	1.98	1.72
2	1.90	7.58	4.18	2.75	3.78	11.75	2.88	3.92	6.25	1.90	1.88	1.71
3	2.05	6.50	4.14	2.55	3.70	10.40	3.10	3.58	5.45	1.95	1.72	1.71
4	2.62	5.62	3.89	2.42	3.52	8.80	3.10	3.25	4.11	1.88	1.68	1.83
5	2.69	5.10	3.65	2.44	3.32	8.10	3.08	2.98	4.86	1.78	1.62	1.82
6	2.62	4.70	3.62	2.28	2.56	7.80	2.95	2.82	5.50	1.72	1.52	1.86
7	2.65	4.38	3.45	2.34	2.42	7.20	3.25	2.78	5.95	1.72	1.48	1.79
8	2.69	4.00	3.20	2.36	2.36	6.65	4.00	2.74	5.80	1.68	1.90	1.90
9	2.72	3.79	2.70	2.39	4.68	6.52	4.38	2.72	4.65	1.60	2.48	1.90
10	2.62	3.58	2.62	2.32	5.88	10.68	4.60	2.62	4.10	1.62	2.65	1.91
11	2.48	3.50	2.52	2.22	6.72	10.32	4.28	2.58	3.40	1.72	2.45	1.85
12	2.52	3.38	2.62	2.08	9.14	8.90	5.05	3.55	2.80	1.68	2.15	1.75
13	2.56	3.26	2.44	2.82	12.50	8.08	6.30	7.20	2.50	1.62	1.92	1.94
14	2.42	3.28	2.35	2.70	11.35	12.95	6.38	8.87	2.35	1.58	1.75	1.81
15	2.58	3.32	2.59	2.70	12.35	13.95	5.60	7.70	2.15	1.54	1.62	1.94
16	2.75	3.26	2.42	2.42	11.40	13.85	5.95	6.50	2.05	1.58	1.68	1.89
17	2.78	3.12	2.46	2.28	10.24	10.75	7.28	5.45	1.85	1.62	1.78	2.48
18	2.58	3.06	2.44	2.22	7.55	8.05	7.20	4.70	1.82	1.72	1.72	2.43
19	5.90	2.90	2.48	2.24	7.02	6.75	6.30	4.02	1.72	1.78	1.68	2.46
20	7.30	2.86	2.58	2.22	13.85	5.90	5.65	3.90	1.62	1.65	1.62	2.39
21	5.88	2.82	3.39	2.12	12.85	5.35	5.10	3.82	1.72	1.62	1.58	2.52
22	4.98	3.02	4.50	2.18	9.85	4.65	4.92	4.05	2.65	1.58	1.50	2.40
23	4.72	3.25	4.98	2.08	7.75	4.14	4.92	4.84	2.75	1.52	1.45	2.27
24	9.58	3.22	4.96	2.20	7.15	3.82	4.82	4.80	2.82	1.52	1.42	2.37
25	12.18	3.33	5.62	2.15	6.80	3.55	4.78	4.92	2.68	1.52	1.40	2.29
26	10.84	3.22	5.62	2.62	6.98	3.40	4.68	6.90	2.62	1.65	1.38	2.16
27	9.75	3.08	5.09	3.00	6.48	3.28	4.20	7.20	2.20	1.62	1.32	2.10
28	8.30	3.05	4.40	3.02	6.45	3.18	4.20	6.98	1.95	1.58	1.32	2.03
29	7.65	3.52	3.88	3.05	-------	3.02	4.40	6.70	1.82	1.68	1.38	1.95
30	8.65	3.12	3.92	3.14	-------	2.98	4.60	7.00	1.78	1.78	1.48	1.99
31	11.20	-------	3.38	3.08	-------	2.92	-------	7.65	-------	1.88	1.89	-------

Daily discharge, in second-feet, of Beaver River at Newport, Lawrence County, for the period October 1, 1916, to September 30, 1918

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1916-1917												
1	141	180	1,262	2,103	6,940	4,130	1,858	701	4,466	2,476	606	364
2	132	190	1,297	1,939	5,672	3,176	1,993	701	4,944	2,141	418	386
3	123	250	1,105	2,179	3,189	2,255	2,593	696	3,578	1,727	346	404
4	116	233	985	3,358	2,179	1,894	2,845	690	2,405	1,381	321	386
5	116	233	940	11,334	1,736	1,418	2,821	1,339	2,693	1,011	300	351
6	112	250	926	20,168	1,727	1,132	4,145	2,315	10,878	888	289	1,822
7	109	227	933	19,051	1,200	1,179	8,670	2,582	15,348	747	342	2,415
8	99	180	838	13,482	946	2,571	9,176	2,455	11,142	606	386	1,684
9	106	191	783	9,220	771	4,342	6,321	2,094	9,532	647	422	1,522
10	122	260	858	6,740	668	4,205	4,342	1,736	12,840	2,905	413	1,207
11	123	289	882	3,820	621	6,960	3,176	1,485	11,940	2,693	377	1,025
12	106	264	801	2,365	555	13,326	2,056	1,255	8,648	1,975	400	713
13	111	246	747	1,778	507	12,965	1,761	985	5,165	2,065	300	585
14	145	300	658	1,325	502	9,992	1,462	876	3,397	2,295	575	507
15	170	469	516	895	507	7,440	1,276	690	2,518	4,978	777	431
16	146	454	459	863	459	4,978	1,125	570	1,894	5,546	606	351
17	150	422	469	870	450	4,025	1,025	546	1,515	6,701	404	308
18	143	408	440	826	590	3,564	920	512	1,220	5,250	342	346
19	296	386	386	747	895	3,062	992	516	1,051	4,130	286	342
20	679	342	373	724	1,538	2,750	1,152	497	1,018	3,241	289	317
21	771	289	400	718	2,047	2,797	1,234	483	870	2,160	282	286
22	690	325	422	1,031	2,094	2,857	1,118	1,018	724	1,617	382	268
23	550	338	431	1,470	1,993	2,809	966	1,939	652	1,339	1,051	268
24	464	550	454	1,813	2,774	4,995	857	2,198	1,346	1,200	1,064	240
25	390	777	492	1,795	3,480	7,000	759	1,736	1,625	1,084	741	220
26	282	895	713	1,650	3,138	5,046	807	1,440	1,297	985	526	282
27	289	753	1,360	1,388	4,070	3,522	920	1,269	1,325	1,220	426	293
28	240	685	4,512	1,186	4,830	2,857	940	1,353	1,432	946	418	300
29	199	801	4,944	1,105	-------	2,486	832	1,948	2,435	952	400	271
30	177	1,005	4,160	2,899	-------	2,385	701	3,704	3,267	857	395	240
31	185	-------	3,125	5,618	-------	2,047	-------	3,480	-------	777	360	-------
1917-1918												
1	250	10,429	1,186	783	888	17,440	690	1,885	5,386	300	293	205
2	264	6,112	1,609	652	1,311	15,885	724	1,410	3,908	264	257	209
3	321	4,280	1,577	550	1,255	12,290	857	1,172	2,845	282	205	201
4	585	3,050	1,388	488	1,134	8,560	857	952	1,553	257	193	240
5	621	2,455	1,220	497	998	7,120	845	783	2,217	224	177	236
6	585	2,065	1,200	422	555	6,530	765	690	2,905	205	154	250
7	600	1,778	1,084	450	488	5,420	952	668	3,480	205	146	227
8	621	1,470	920	459	459	4,512	1,470	647	3,280	193	264	264
9	637	1,318	626	473	2,047	4,311	1,778	637	2,020	172	516	264
10	585	1,172	585	440	3,384	12,990	1,975	585	1,545	177	600	265
11	516	1,118	536	395	4,622	12,090	1,693	565	1,051	205	502	246
12	536	1,038	585	334	9,308	8,780	2,405	1,152	679	193	364	214
13	555	1,025	497	690	18,100	7,080	3,980	5,420	526	177	271	278
14	488	972	454	626	14,765	19,490	4,100	8,714	454	167	214	233
15	565	998	473	626	17,650	23,000	3,025	6,340	364	158	177	278
16	652	959	488	488	14,900	22,620	3,480	4,280	321	167	193	260
17	668	870	507	422	11,890	13,170	5,564	2,845	246	177	224	516
18	585	832	497	395	6,055	7,920	5,420	2,065	236	205	205	492
19	3,410	735	516	404	5,114	4,670	3,980	1,485	205	224	193	507
20	5,600	713	565	395	22,620	3,410	3,088	1,395	177	185	177	473
21	3,384	690	1,044	351	19,175	2,728	2,455	1,339	205	177	167	536
22	2,335	807	1,885	377	10,950	2,020	2,275	1,508	600	167	150	478
23	2,084	952	2,335	334	6,435	1,577	2,275	2,198	652	154	141	418
24	10,314	933	2,315	386	5,335	1,339	2,179	2,160	690	154	136	464
25	17,140	1,005	3,050	364	4,750	1,152	2,141	2,275	616	154	132	426
26	13,404	933	3,050	585	5,046	1,051	2,047	4,910	585	185	128	368
27	10,710	845	2,445	795	4,250	972	1,625	5,420	386	177	119	342
28	7,520	826	1,795	807	4,205	907	1,625	5,046	282	167	119	313
29	6,245	1,132	1,381	826	-------	807	1,795	4,590	236	193	128	282
30	8,245	870	1,410	882	-------	783	1,975	5,080	224	224	146	296
31	14,360	-------	1,038	845	-------	747	-------	6,245	-------	257	260	-------

Estimated Monthly Discharge of Beaver River at Newport, Lawrence County.
(Drainage area 2,125 square miles)

Month	Discharge in Second-feet			Run-off	
	Maximum	Minimum	Mean	Second-feet per square mile	Depth in inches
1916-1917					
October	771	99	241	0.113	0.130
November	1,005	180	407	0.192	0.214
December	4,944	373	1,182	0.556	0.641
January	20,168	718	4,012	1.888	2.177
February	6,940	450	2,006	0.944	0.983
March	13,326	1,132	4,328	2.037	2.349
April	9,176	701	2,295	1.080	1.205
May	3,704	483	1,413	0.665	0.767
June	15,348	652	4,372	2.057	2.296
July	6,701	606	2,146	1.010	1.165
August	1,064	282	459	0.216	0.249
September	2,415	220	604	0.284	0.317
The year	20,168	99	1,956	0.920	12.493
1917-1918					
October	17,140	250	3,689	1.736	2.002
November	10,429	690	1,746	0.822	0.917
December	3,050	454	1,234	0.581	0.670
January	882	334	534	0.251	0.289
February	22,620	459	7,060	3.322	3.458
March	23,000	747	7,435	3.495	4.030
April	5,564	690	2,268	1.067	1.191
May	8,714	565	2,715	1.278	1.474
June	5,386	177	1,262	0.594	0.663
July	300	154	198	0.093	0.107
August	600	119	224	0.105	0.121
September	536	202	326	0.153	0.171
The year	23,000	119	2,364	1.112	15.093

TABLE NO. XXXIII.

Miscellaneous discharge measurements of Pennsylvania streams for the period October 1, 1916, to September 30, 1918

Stream	Location	Date	Drainage Area above point	Gage height	Total discharge	Discharge per sq. mile tributary drainage area	Remarks
			Sq. mi.	Feet	Sec.-ft.	Sec.-ft.	
1916-1917							
Outlet, Sandy Lake	Sandy Lake	Mar. 22, 1917	8.07	1.12	13	1.61	At gaging station
Outlet, Sandy Lake	Sandy Lake	April 28, 1917	8.07	0.85	5	0.62	At gaging station
Outlet, Sandy Lake	Sandy Lake	May 17, 1917	8.07	0.80	3	0.37	At gaging station
Outlet, Sandy Lake	Sandy Lake	July 20, 1917	8.07	1.33	15	1.86	At gaging station
Schuylkill River	Conshohocken	Mar. 29, 1917	1,795	8.16	10,740	5.98	At abandoned gaging station
Schuylkill River	Conshohocken	Mar. 31, 1917	1,795	6.44	5,744	3.20	At abandoned gaging station
Schuylkill River	Conshohocken	April 21, 1917	1,795	4.07	1,944	1.08	At abandoned gaging station
Swatara Creek	Jonestown	Feb. 15, 1917	190	4.20	101	0.53	Ice cover. At abandoned gaging station
Swatara Creek	Jonestown	Feb. 21, 1917	190	4.40	265	1.40	Partial ice cover. At abandoned station
Swatara Creek	Jonestown	April 9, 1917	190	4.46	586	3.08	At abandoned gaging station
Swatara Creek	Jonestown	July 2, 1917	190	3.36	112	0.59	At abandoned gaging station
Youghiogheny River	West Newton	Jan. 6, 1917	1,510	7.32	13,776	8.46	At gaging station
Youghiogheny River	West Newton	Jan. 22, 1917	1,510	19.05	49,734	32.94	At gaging station
Youghiogheny River	West Newton	Jan. 23, 1917	1,510	12.25	25,995	17.22	At gaging station
Youghiogheny River	West Newton	Jan. 23, 1917	1,510	9.90	19,580	12.97	At gaging station
1917-1918							
Bald Eagle Creek	Tyrone	Aug. 22, 1918	48	-------	11	0.23	Referenced
Little Pine Creek	Waterville	July 19, 1918	171	-------	40	0.23	Referenced
Little Pine Creek	Waterville	Sept. 21, 1918	171	-------	514	3.01	Referenced
Neshannock Creek	New Castle	Oct. 29, 1917	243	-------	974	4.01	
Neshannock Creek	New Castle	Oct. 29, 1917	243	-------	953	3.92	
Neshannock Creek	New Castle	Oct. 31, 1917	243	-------	1,480	6.09	
Neshannock Creek	New Castle	Nov. 6, 1917	243	-------	278	1.14	
Neshannock Creek	New Castle	Nov. 9, 1917	243	-------	230	0.95	
Shenango River	Greenville	Feb. 18, 1918	297	0.73	832	2.80	Gage height=head on dam
Shenango River	Greenville	Feb. 20, 1918	297	2.38	3,806	12.81	Gage height=head on dam
Shenango River	Greenville	Feb. 27, 1918	297	0.48	567	1.91	Gage height=head on dam
Shenango River	Greenville	Mar. 1, 1918	297	1.73	2,711	9.13	Gage height=head on dam
Shenango River	Greenville	Mar. 2, 1918	297	0.97	1,240	4.18	Gage height=head on dam
Shenango River	Greenville	Mar. 4, 1918	297	0.55	807	2.72	Gage height=head on dam

TABLE NO. XXXIV.

Summary of Run-off in Second-feet per Square Mile, for the period October 1, 1916, to September 30, 1918
Delaware Basin.

Station	Drainage Area	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Year
1916-1917														
Lackawaxen River at Hawley	290	0.26	0.24	0.38	0.44	0.61	3.52	1.93	1.30	2.18	1.06	0.66	0.22	1.07
Wallenpaupack Creek at Wilsonville	239	0.37	0.32	0.67	1.26	0.71	3.04	2.64	1.77	3.51	1.10	0.93	0.32	1.39
Delaware River at Port Jervis, N. Y.	3,250	0.61	0.62	1.46	1.96	0.62	5.20	3.20	1.48	3.29	1.47	0.78	0.46	1.77
Lehigh River at Bethlehem	1,235	0.57	0.48	1.01	2.40	1.14	2.95	2.29	1.16	2.68	1.53	1.78	0.73	1.56
Delaware River at Riegelsville	6,430	0.62	0.61	1.22	1.84	0.85	3.58	2.95	1.42	2.74	1.45	0.99	0.58	1.57
Brandywine Creek at Chadds Ford	285	0.64	0.56	0.66	1.42	0.98	2.26	1.30	0.88	1.49	0.87	0.57	0.58	1.02
1917-1918														
Wallenpaupack Creek at Wilsonville	239	1.28	1.39	0.64	0.95	2.46	3.61	4.14	1.77	0.70	0.24	0.22	0.59	1.49
Delaware River at Port Jervis, N. Y.	3,250	1.45	1.76	0.62	0.40	2.45	4.38	3.30	1.58	1.06	0.42	0.19	0.50	1.50
Lehigh River at Bethlehem	1,235	1.30	1.68	0.80	0.82	2.56	3.45	3.81	2.01	1.26	0.65	0.61	0.56	1.62
Delaware River at Riegelsville	6,430	1.08	1.68	0.60	0.64	2.94	4.15	3.55	1.71	1.17	0.54	0.38	0.54	1.54

TABLE NO. XXXV.

Summary of Run-off in Second-feet per Square Mile, for the period October 1, 1916, to September 30, 1918
Susquehanna Basin.

Station	Drainage Area	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Year
1916-1917														
North Branch Susquehanna River at Wilkes-Barre	9,960	0.49	0.52	0.69	0.82	0.43	2.67	2.01	1.31	2.73	1.70	1.41	0.54	1.29
North Branch Susquehanna River at Danville	11,200	0.56	0.55	0.82	1.46	0.55	2.80	2.09	1.26	2.79	1.70	1.52	0.68	1.40
West Branch Susquehanna River at Bower	320	0.38	0.55	0.92	3.25	1.91	4.13	1.60	1.07	1.93	1.06	1.21	0.92	1.58
Clearfield Creek at Dimeling	370	0.32	0.38	0.72	3.73	1.50	4.05	1.89	1.62	2.33	1.58	0.60	0.46	1.61
Bald Eagle Creek at Milesburg	140	0.40	0.09	0.19	1.33	1.71	3.44	1.11	0.75	1.12	0.76	0.19	0.09	0.93
Bald Eagle Creek at Beech Creek	565	0.39	0.38	0.42	1.11	1.24	3.01	1.84	1.28	1.32	0.96	0.57	0.35	1.07
Pine Creek at Waterville	750	0.30	0.30	0.42	0.59	0.61	3.76	1.97	1.93	2.80	2.00	1.29	0.64	1.39
West Branch Susquehanna River at Williamsport,	5,670	0.39	0.30	0.51	1.44	0.94	3.84	2.15	1.59	2.20	1.32	1.14	0.43	1.36
Raystown Branch Juniata River at Saxton	790	0.39	0.27	0.48	1.71	1.49	3.92	1.56	0.63	1.99	0.51	0.41	0.40	1.14
Tuscarora Creek near Port Royal	205	0.44	0.24	0.17	1.23	1.36	2.96	1.50	0.51	0.53	0.57	0.19	0.34	0.83
Juniata River at Newport	3,380	0.56	0.38	0.27	1.22	1.30	3.31	1.78	0.84	1.47	1.06	0.50	0.53	1.10
Conodoguinet Creek at Brysons Bridge,	460	0.82	0.41	0.46	2.76	1.66	2.85	1.31	0.62	0.58	0.69	0.74	1.20	1.17
Susquehanna River at Harrisburg	24,100	0.51	0.42	0.54	1.14	0.75	3.02	2.04	1.09	2.11	1.33	1.18	0.59	1.23
Yellow Breeches Creek at Olmsted's Mill	223	1.01	0.91	0.85	1.13	1.86	2.14	1.53	1.09	0.94	--------	--------	0.76	--------
1917-1918														
North Branch Susquehanna River at Wilkes-Barre	9,960	1.53	1.39	0.25	0.15	1.88	4.16	2.81	1.69	0.97	0.37	0.15	0.52	1.32
North Branch Susquehanna River at Danville	11,200	1.59	1.63	0.36	0.21	2.25	4.38	3.09	1.63	1.08	0.46	0.25	0.62	1.46
West Branch Susquehanna River at Bower	320	2.60	0.77	0.28	0.21	6.00	3.69	2.58	2.27	0.92	0.22	1.04	2.12	1.86
Clearfield Creek at Dimeling	370	1.88	0.77	0.24	0.17	4.59	3.30	2.44	2.08	1.08	0.27	0.56	1.46	1.55
Bald Eagle Creek at Mileshurg	140	0.96	0.34	0.22	0.24	7.21	3.20	2.86	2.84	0.56	0.09	0.39	1.17	1.64
Bald Eagle Creek at BeechCreek Station	565	1.16	0.78	0.37	0.37	3.56	2.99	2.54	1.86	1.20	0.42	0.41	1.04	1.38
Pine Creek at Waterville	750	2.53	1.28	0.34	0.25	3.40	5.13	3.41	2.52	1.44	0.48	0.35	1.59	1.89
West Branch Susquehanna River at Williamsport,	5,670	2.08	1.17	0.27	0.17	2.84	4.48	2.93	2.35	1.56	0.42	0.43	1.32	1.66
Raystown Branch Juniata River near Saxton	790	1.00	0.44	0.22	0.18	4.29	2.38	3.95	0.85	0.41	0.22	0.21	0.25	1.17
Tuscarora Creek near Port Royal	205	1.51	0.54	0.18	0.22	3.91	2.11	5.11	0.66	0.23	0.12	0.61	1.07	1.33
Juniata River at Newport	3,380	1.18	0.80	0.26	0.25	3.73	2.82	3.88	1.25	0.78	0.34	0.49	0.59	1.34
Susquehanna River at Harrisburg	24,100	1.50	1.47	0.37	0.26	2.78	4.03	3.15	1.61	1.14	0.43	0.33	0.73	1.47
Yellow Breeches Creek at Olmstead's Mill	223	1.29	1.30	0.80	0.76	3.27	2.36	3.39	1.77	1.35	0.85	0.85	0.69	1.54

TABLE NO. XXXVI.

Summary of Run-off in Second-feet per Square Mile, for the period October 1, 1916, to September 30, 1918
Ohio Basin.

Station	Drainage Area	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Year
1916-1917														
Oil Creek at Rouseville	330	0.39	1.12	1.56	2.23	1.46	5.06	2.28	3.48	3.82	1.98	0.45	0.27	2.01
Cussewago Creek above Meadville	88	0.18	0.82	1.31	1.05	0.81	3.12	1.83	2.20	2.26	1.53	0.14	0.08	1.28
Allegheny River at Kittanning	9,010	0.33	0.72	1.41	2.02	1.52	4.43	2.25	2.33	3.46	2.41	0.64	0.37	1.83
Crooked Creek at Hileman's Farm, Armstrong County	279	0.24	0.47	1.21	4.19	3.17	2.32	1.01	0.49	1.24	2.68	0.16	0.42	1.46
Stony Creek at Johnstown	465	0.49	0.41	1.04	3.23	2.14	4.65	1.79	0.83	2.52	0.72	0.41	0.31	1.54
Blacklick Creek at Blacklick	386	0.34	0.72	1.52	3.84	1.81	3.32	1.43	1.02	2.31	0.87	1.28	0.97	1.62
Kiskiminitas River at Avonmore	1,720	0.32	0.54	1.62	4.19	3.85	1.81	1.72	0.96	2.10	1.14	0.66	0.50	1.62
Youghiogheny River at Connellsville	1,320	0.66	0.61	1.73	4.35	1.89	5.64	1.97	1.63	2.45	0.69	0.36	0.29	1.86
Slippery Rock Creek at Wurtenburg	400	0.22	0.40	1.08	1.92	1.46	2.68	1.16	1.20	2.90	1.98	0.50	0.65	1.34
Shenango River at Turnerville	152	0.11	0.30	1.08	2.75	1.38	3.30	1.90	1.40	1.91	0.99	0.15	0.27	1.30
Little Shenango River at Greenville	107	0.20	0.49	0.86	2.76	1.38	2.68	1.36	1.23	2.60	1.17	0.21	0.17	1.26
Pymatuning Creek below Orangeville	170	0.08	0.22	0.96	2.32	1.14	2.64	1.39	0.87	2.13	1.38	0.08	0.30	1.13
Shenango River at Sharon	611	0.11	0.26	0.82	2.16	1.14	2.46	1.37	1.00	1.99	1.30	0.15	0.27	1.09
Shenango River at New Castle	797	0.13	0.28	0.83	2.18	1.11	2.44	1.29	0.88	2.08	1.25	0.15	0.28	1.08
Mahoning River at New Castle	1,070	0.08	0.11	0.34	1.68	0.78	1.65	0.86	0.42	1.84	0.51	0.20	0.24	0.72
Beaver River at Newport	2,125	0.11	0.19	0.56	1.89	0.94	2.04	1.08	0.66	2.06	1.01	0.22	0.28	0.92
1917-1918														
Oil Creek at Rouseville	330	3.12	1.05	0.49	0.17	3.70	5.64	1.89	2.19	0.67	0.36	0.28	0.67	1.68
Cussewago Creek above Meadville	88	2.94	1.34	0.62	0.17	4.34	3.76	0.94	0.82	0.17	0.05	0.03	0.48	1.28
Allegheny River at Kittanning	9,010	2.76	1.82	0.67	0.35	4.02	5.11	1.73	1.69	1.11	0.34	0.36	0.74	1.71
Crooked Creek at Hileman's Farm	279	2.71	0.42	0.62	0.20	5.70	1.61	0.44	1.30	1.65	0.11	0.34	1.02	1.31
Stony Creek at Johnstown	468	1.11	0.62	0.28	0.20	4.74	3.61	3.50	1.22	0.65	0.18	0.19	0.27	1.36
Blacklick Creek at Blacklick	386	2.34	0.71	0.66	0.18	5.78	2.85	2.33	1.29	0.69	0.15	0.41	1.49	1.54
Kiskiminitas River at Avonmore	1,720	1.71	0.75	0.53	0.33	4.98	2.98	2.71	1.39	0.77	0.27	0.37	0.97	1.45
Youghiogheny River at Connellsville	1,320	0.75	0.40	0.59	0.38	7.08	3.74	3.39	1.82	0.79	0.19	0.36	0.75	1.64
Slippery Rock at Wurtemburg	400	3.08	0.99	0.46	0.32	3.68	2.78	1.64	1.68	0.86	0.20	0.27	0.40	1.34
Shenango River at Turnersville	152	2.76	1.51	0.82	0.14	3.32	4.58	0.83	1.05	0.39	0.06	0.05	0.19	1.30
Little Shenango River at Greenville	107	2.75	0.72	0.88	0.26	3.03	3.23	1.04	1.35	0.56	0.17	0.12	0.29	1.19
Pymatuning Creek below Orangeville	170	2.60	1.20	0.85	0.17	2.96	4.27	1.12	1.44	0.36	0.06	0.07	0.12	1.26
Shenango River at Sharon	611	2.22	1.08	0.76	0.16	2.96	3.59	0.96	1.29	0.40	0.10	0.06	0.16	1.13
Shenango River at New Castle	797	2.12	1.09	0.80	0.17	3.04	3.67	1.08	1.39	0.56	0.08	0.08	0.16	1.18
Mahoning River at New Castle	1,070	1.89	0.58	0.41	0.25	2.60	2.46	0.73	0.85	0.46	0.14	0.17	0.14	0.88
Beaver River at Newport	2,125	1.74	0.82	0.58	0.25	3.32	3.50	1.07	1.28	0.59	0.09	0.10	0.15	1.11

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APPENDIX II

REPORT UPON THE PYMATUNING RESERVOIR PROJECT

By

FREDERIC P. STEARNS, Consulting Engineer.

FREDERIC P. STEARNS
CONSULTING ENGINEER
1 Ashburton Place, Boston.

May 11, 1916.

Pennsylvania Water Supply Commission,

Gentlemen:—

In accordance with your request, I have examined and studied certain features of the Pymatuning Reservoir Project on the Shenango River, in the westerly part of Pennsylvania.

I spent two days—March 22 and 23, 1916, in examining the information which had been collected in the course of the investigation of the project and in visiting the proposed dam site. March 24, 1916, was spent in conference with members of your Commission and your Chief Engineer, in Harrisburg.

After returning to my office, I was furnished with a large number of records of precipitation in the vicinity of the proposed reservoir, and an extensive tabulation of the precipitation and run-off for various points on the Shenango River drainage area above New Castle from December, 1911, to the end of February, 1916. These records, together with those contained in your published Annual Reports, enabled me to review the hydrographic data and form an opinion as to the minimum discharge which could be maintained in the Shenango River at Sharon from the use of the Pymatuning Reservoir as designed.

The report which follows relates mainly to two specific features:

1. A review of the hydrographic data and a determination of the minimum discharge which may be maintained in the river at Sharon by the operation of the Pymatuning Reservoir.
2. Matters relating to the feasibility and design of the proposed Pymatuning Dam.

REVIEW OF HYDROGRAPHIC DATA.

The general principle involved in the regulation of stream flow by means of a reservoir upon it is that the water running in the stream at the point where the dam of the reservoir is built shall be accumulated in the reservoir during seasons of high flow and be let down from the reservoir into the stream below during dry periods of the year, at such rates as will maintain a practically constant flow at any point on the stream where a constant flow is desired.

If there were an accurate record for a long period of the discharge of the river at the proposed dam site, and another accurate record for a long period of the discharge of the river at the point where a constant minimum flow is desired, computations could be made showing what would have happened in the past had the reservoir been in existence. Experience has shown that conditions existing during

a given long period of years do not differ very much from those which occur in a subsequent long period of years, so one can forecast the future with a reasonable degree of accuracy by assuming that the conditions in the future will not differ materially from those that have existed in the past.

DISCHARGE OF RIVER AT TURNERVILLE AND SHARON DURING WINTER MONTHS

The actual gaging of the Shenango River at Sharon did not begin until August, 1909, and at Turnerville, near where the Pymatuning Dam is to be located, until February, 1912. The discharge of this stream at earlier dates must be determined by inference from the amount of precipitation upon the drainage area and from the flow per square mile of drainage area of other streams which were measured in this part of the state.

I have thought it best to adopt June 1, 1908, as a starting point of computations, because the records of precipitation and discharge of streams indicate that if the reservoir had been in existence it probably would have been full at that date.

It may be said in passing that the measurement of the discharge of the Shenango River at Turnerville is a very difficult matter in winter, when the method used is the determination of the discharge from observed heights of the river, because owing to the very cold winters at this place the discharge corresponding to any given height of the water is greatly affected by the ice which forms on and to some extent in the river. The measurement of the discharge at Sharon is made under the favorable condition that ice does not form because of the warming of the river water by the steel mills in this vicinity. This is a particularly fortunate circumstance, as it makes the stream gagings at Sharon much more dependable than they would be if the surface of the water were covered with ice.

In view of the uncertainty of stream gagings where the streams are covered with ice, it is always desirable to test the discharge as measured during the winter period by comparing it with the precipitation for the same period. This cannot be done from month to month because the precipitation at this season of the year generally occurs in the form of snow, and if the weather remains cold the snow remains on the ground for a considerable time and the water is not contributed to the stream until a subsequent month when there is a thaw. By combining the records of the months from December to April, inclusive, the effect of precipitation stored upon the surface of the ground in the form of snow is practically eliminated because little snow falls before the first of December, and nearly all of the precipitation during these months will have found its way into the stream by the end of April. During this period of five months, the weather being cold, the evaporation is generally low and a very large

part of the precipitation finds its way into the stream and is represented by the stream discharge.

It is often found that measurements made when there is ice on or in a river give a larger discharge than the amount of water represented by the precipitation. This means either an error in the precipitation records or in the stream gaging, or in both, but when there are many precipitation stations which give results which accord well with one another it is best to assume that the precipitation is substantially correct, and that the discharge or run-off during the five months is the amount of the precipitation less the probable amount of evaporation during this period. This method gives more accurate results than the use of the measured discharge.

The following table shows for the period from December to April of each year, beginning in December, 1908, the precipitation upon the drainage area above Turnerville, in inches, the measured discharge of the Shenango River at Turnerville and at Sharon in those periods when measurements were made, the discharge being represented by the equivalent depth in inches on the drainage area, frequently termed the "run-off in inches", and finally the adopted number of inches of run-off which seemed most reasonable after comparing the actual measurements of the discharge of the Shenango River and of other streams with the total discharge for the five months deduced from the precipitation on the drainage area above Turnerville.

Months	Precipitation on Drainage Area Above Turnerville. Inches	RUN-OFF IN INCHES		
		As Computed from Stream Gagings at		Adopted as Quantity at Turnerville
		Sharon	Turnerville	
Dec. 1908	3.38			0.60
Jan. 1909	3.54			2.40
Feb.	4.64			4.00
March	2.80			3.30
April	5.16			3.40
Totals	19.52			13.70
Dec. 1909	2.34			0.40
Jan. 1910	5.70	1.61		1.80
Feb.	4.21	1.53		1.70
March	0.38	5.87		6.20
April	3.31	1.01		1.10
Totals	15.94	10.02		11.20
Dec. 1910	3.37	1.69		1.69
Jan. 1911	3.64	4.65		4.70
Feb.	2.74	2.21		2.30
March	2.76	1.24		1.30
April	3.99	1.96		2.10
Totals	16.50	11.75		12.09
Dec. 1911	4.19	2.67		2.67
Jan. 1912	3.07	1.29		1.20
Feb.	1.89	1.53	1.89	1.50
March	3.43	5.17	6.77	5.17
April	5.17	4.05	4.37	4.17
Totals	17.75	14.71	13.03	14.71

Months	Precipitation on Drainage Area Above Turnerville. Inches	RUN-OFF IN INCHES		
		As Computed from Stream Gagings at		Adopted as Quantity at Turnerville
		Sharon	Turnerville	
Dec. 1912	3.26	0.95	1.29	1.00
Jan. 1913	6.80	7.22	7.81	7.60
Feb.	2.15	0.79	0.62	0.62
March	8.90	7.45	7.27	7.27
April	2.24	1.28	1.30	1.30
Totals	23.35	17.69	18.29	17.79
Dec. 1913	1.74	0.90	1.14	0.80
Jan. 1914	2.88	2.68	3.89	2.50
Feb.	1.55	1.17	1.75	1.00
March	2.74	3.04	3.93	3.00
April	5.07	3.93	4.57	4.00
Totals	13.98	11.72	15.28	11.30
Dec. 1914	3.46	1.27	2.40	1.20
Jan. 1915	2.69	1.83	3.01	1.83
Feb.	2.69	4.19	6.29	4.19
March	0.98	0.68	0.86	0.68
April	0.91	0.34	0.45	0.34
Totals	10.73	8.31	13.01	8.24
Dec. 1915	3.18	1.93	2.91	1.80
Jan. 1916	2.42	3.52	5.41	3.35
Feb.	1.70	0.82	1.04	0.80
Totals	7.30	6.27	9.36	5.95

The above table shows the adopted run-off at Turnerville during the five months of the year when by far the greater part of the annual discharge of streams takes place. During the remaining months of the year the actual stream gagings at Turnerville have been used for those periods when they were available. During the period of more than two years when gagings were made at Sharon and not at Turnerville, the run-off in inches at Sharon has been used as a basis for determining the discharge at Turnerville, but small changes have been made to conform to differences in the precipitation upon the respective drainage areas.

Before measurements were made at Sharon, the discharge at Turnerville has been based upon the measured discharge of other streams in this part of Pennsylvania, but corrections have been made for the differences in the precipitation upon the drainage areas of these streams and upon the drainage area above Turnerville.

The figures finally adopted for precipitation and run-off above Turnerville, for all months from June, 1908, to February, 1916, inclusive, are given below. For those months when no gagings were made at Sharon, the run-off in inches at this place has been assumed to be the same as at Turnerville.

Months	Precipitation on Drainage Area Above Turnerville. Inches	Run-off at Turnerville. Inches
June 1908	2.77	0.70
July	3.17	0.50
Aug.	1.51	0.20
Sept.	0.83	0.07
Oct.	1.53	0.09
Nov.	1.47	0.12
Dec. 1908	3.38	0.60
Jan. 1909	3.54	2.40
Feb.	4.64	4.00
Mar.	2.80	3.30
Apr.	5.16	3.40
Total	19.52	13.70
Per Cent.		70.2
May 1909	3.03	3.30
June	4.63	1.60
July	2.66	0.30
Aug.	2.30	0.09
Sept.	1.38	0.06
Oct.	1.44	0.07
Nov.	2.20	0.12
Year	37.16	19.24
Per Cent.		51.8
Dec. 1909	2.34	0.40
Jan. 1910	5.70	1.80
Feb.	4.21	1.70
Mar.	0.38	6.20
Apr.	3.31	1.10
Total	15.94	11.20
Per Cent.		70.3
May	3.46	1.20
June	1.89	0.70
July	3.08	0 11
Aug.	1.50	0.06
Sept.	5.02	0.16
Oct.	4.00	0.36
Nov.	3.23	1.37
Year	38.12	15.16
Per Cent.		39.8
Dec. 1910	3.37	1.69
Jan. 1911	3.64	4.70
Feb.	2.74	2.30
Mar.	2.76	1.30
Apr.	3.99	2.10
Total	16.50	12.09
Per Cent.		73.3
May	1.89	0.61
June	4.36	0.30
July	1.80	0.12
Aug.	6.12	0.39
Sept.	6.46	2.60
Oct.	5.68	3.00
Nov.	3.13	1.92
Year	45.94	21.03
Per Cent.		45.8
Dec. 1911	4.19	2.67
Jan. 1912	3.07	1.20
Feb.	1.89	1.50
Mar.	3.43	5.17
Apr.	5.17	4.17
Total	17.75	14.71
Per Cent.		82.9

Months	Precipitation on Drainage Area Above Turnerville. Inches	Run-off at Turnerville. Inches
May 1912	2.30	1.26
June	2.83	0.35
July	5.00	0.11
Aug.	6.00	0.24
Sept.	3.30	0.31
Oct.	4.90	2.76
Nov.	1.60	1.33
Year	44.18	21.07
Per Cent.		47.7
Dec. 1912	3.26	1.00
Jan. 1913	6.80	7.60
Feb.	2.15	0.62
Mar.	8.90	7.27
Apr.	2.24	1.30
Total	23.35	17.79
Per Cent.		76.2
May	2.60	0.37
June	5.20	0.70
July	4.65	1.14
Aug.	1.50	0.09
Sept.	1.30	0.07
Oct.	4.50	0.31
Nov.	3.00	2.50
Year	46.10	22.97
Per Cent.		49.8
Dec. 1913	1.74	0.80
Jan. 1914	2.88	2.50
Feb.	1.55	1.00
Mar.	2.74	3.00
Apr.	5.07	4.00
Total	13.98	11.30
Per Cent.		80.8
May	4.58	3.20
June	3.36	0.13
July	3.41	0.15
Aug.	4.68	0.08
Sept.	1.34	0.09
Oct.	3.20	0.20
Nov.	2.14	0.35
Year	36.69	15.40
Per Cent.		42.0
Dec 1914	3.46	1.20
Jan. 1915	2.69	1.83
Feb.	2.69	4.19
Mar.	0.98	0.68
Apr.	0.91	0.34
Total	10.73	8.24
Per Cent.		76.8
May	3.70	0.63
June	3.03	0.17
July	6.28	1.23
Aug.	5.25	1.29
Sept.	2.88	0.22
Oct.	2.60	0.57
Nov.	2.34	0.90
Year	36.81	13.25
Per Cent.		36.0
Dec. 1915	3.18	1.80
Jan. 1916	2.42	3.35
Feb.	1.70	0.80

EFFECT OF RESERVOIR SURFACE UPON DISCHARGE

The adopted discharge at Turnerville represents the run-off from a drainage area having the proportion of land and water surfaces which now exists. When the reservoir having an area of nearly 25 square miles is created, there will be a large evaporation, especially in summer, from the surface of the reservoir—much larger than that which now takes place from the land surface to be submerged, and it is necessary to take into account the changed conditions in this respect created by the construction of the reservoir. This can best be done by treating the reservoir surface independently from the remainder of the drainage area.

When there is precipitation upon the reservoir surface, the full amount should at once be credited to the water supply, while the amount of evaporation which takes place from the water surface should be debited. In other words, the yield of the water surface in any month is the difference between the precipitation and the evaporation during that month, and is a positive or negative quantity according to whether the precipitation exceeds the evaporation or the evaporation the precipitation.

When one thus treats the water surface as an independent factor, the total drainage area must be diminished by the amount of reservoir surface, and the usual run-off data must be applied only to the remaining land surface. As the reservoir is drawn upon to supply water, its surface lowers and becomes smaller, and in the computations subsequently given the varying area of the reservoir surface is taken into account.

As a basis for estimating the amount of evaporation from the reservoir surface, I have adopted the figures in the Annual Report of your Commission, for the year 1912, Appendix A, page 51, which are as follows:

Month.	Evaporation. Inches.
January	0.75
February	0.85
March	1.35
April	2.35
May	3.50
June	4.35
July	4.70
August	4.30
September	3.25
October	2.50
November	1.80
December	1.20
Total	30.90

Some subsequent observations of evaporation by your engineers gave a slightly smaller quantity for the years 1913-1914, but it did not seem to me advisable to reduce the amount below that given in the 1912 Report.

OPERATION OF PYMATUNING RESERVOIR

A table is given below showing all the computations of the quantities of water which would have run into and been drawn from the Pymatuning Reservoir if it had been in existence during the period from June 1, 1908, to February, 1916, inclusive, and full at the earlier date, as the records indicate that it would have been had it been in existence.

The table is based on the assumption that the water would be drawn only for the maintenance of a uniform minimum flow of 450 cubic feet per second at Sharon, and on the further assumption that the exact quantity required to supply the deficiency at Sharon could be furnished, although this could not be done exactly in actual operation because of the long distance (about 33 miles measured along the river) between the dam and Sharon.

The table also shows the quantity of water remaining in the reservoir at different dates, the elevation of the water surface of the reservoir at such dates, and the amount of water which would have been wasted over the dam of the reservoir during the spring of some years.

TABLE NO. XXXVII

Table Showing Quantity of Water in Pymatuning Reservoir at Various Dates, Had it Been in Existence from June 1, 1908, to March 1, 1916, and Had Water Been Drawn from it to Maintain a Constant Minimum Flow of 450 Cubic Feet per Second at Sharon.

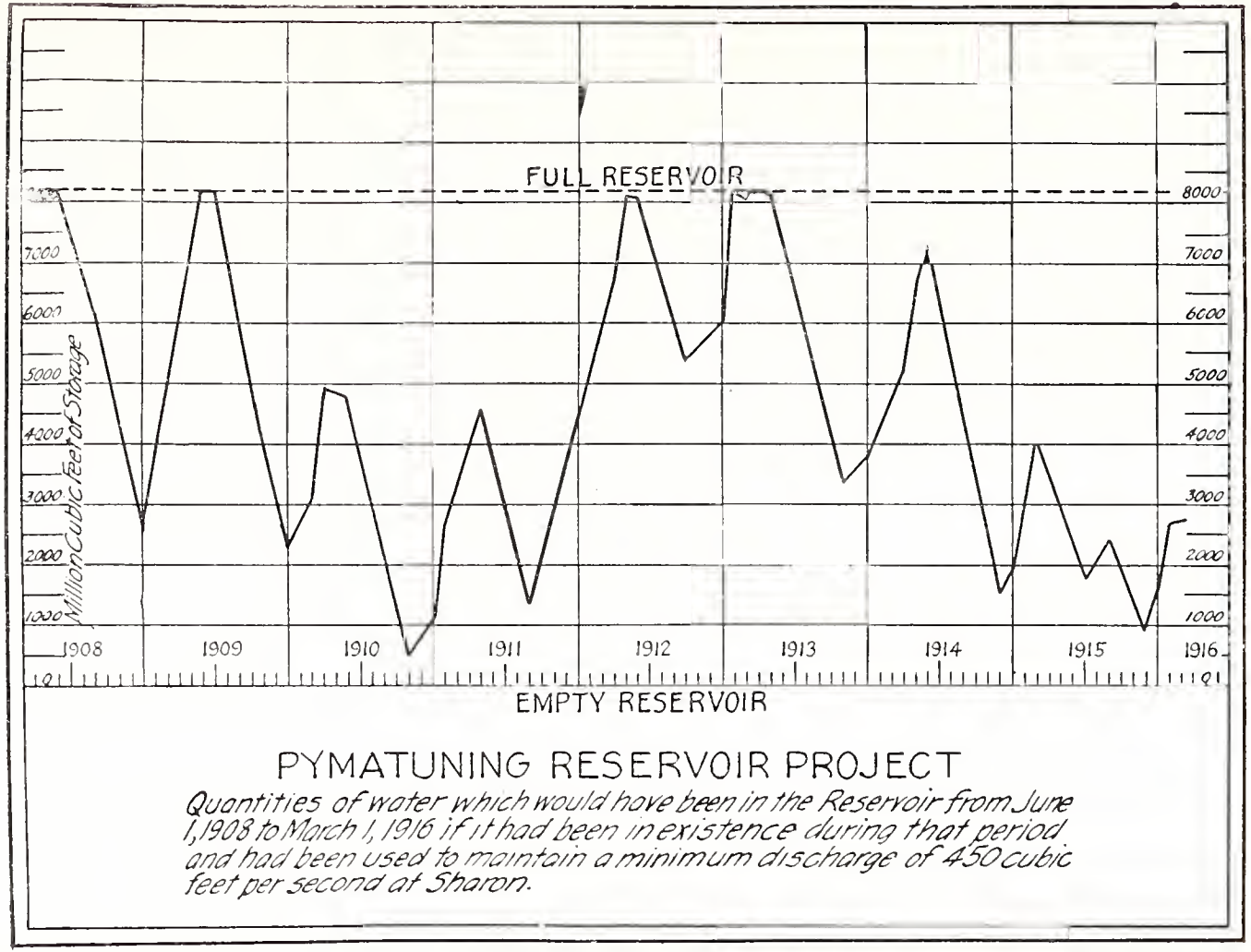
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Period.	Precipitation. Inches.	Evaporation. Inches.	Excess of Precipitation. Inches.	Excess of Evaporation. Inches.	Area of Reservoir Surface. Sq. Miles.	Gain Due to Excess of Precipitation on Water Surface. Mil. Cu. Ft.	Loss Due to Excess of Evaporation from Water Surface. Mil. Cu. Ft.	Run-off from Land Surface. Depth in Inches.	Area of Land Surface. Sq. Miles.	Discharge from Land Surface. Mil. Cu. Ft.	Net Quantity Entering Reservoir Land and Water Surfaces Combined. Mil. Cu. Ft.	Draft from Reservoir to Maintain Flow at Sharon. Mil. Cu. Ft.	Added to Storage. Mil. Cu Ft.	Taken from Storage. Mil Cu Ft.	Quantity Remaining in Reservoir at Beginning of Period Mil. Cu. Ft.	Elevation of Water Surface. Feet.	Quantity Wasted over Dam. Mil. Cu. Ft.
June 1, 1908					24.7				133.0						8,182	1,008.0	
June 1-Aug. 31	7.45	13.35		5.90			315	1.40		438	123	2,107		1,984			
Sept. 1					21.3				136.4						6,198	1,004.9	
Sept. 1-Dec. 31	7.21	8.75		1.54			62	0.88		287	225	3,815		3,590			
Jan. 1, 1909					13.1				144.6						2,608	997.5	
Jan. 1-Mar. 31	10.98	2.95	8.03				318	9.70		3,170	3,488	0	3,488				
Apr. 1					21.0				136.7						6,096	1,004.7	
Apr. 1-30	5.16	2.35	2.81				144	3.40		1,072	1,216	0	1,216				
May 1					23.2				134.5						7,312	1,006.7	
May 1-31	3.03	3.50		0.47			26	3.30		1,025	999	0	999				129
June 1					24.7				133.0						8,182	1,008.0	
June 1-30	4.63	4.35	0.28				16	1.60		494	510	0	510				510
July 1					24.7				133.0						8,182	1,008.0	
July 1-Sept. 30	6.34	12.25		5.91			298	0.45		142	−156	3,094		3,250			
Oct. 1					18.7				139.0						4,932	1,002.6	
Oct. 1-Dec. 31	5.98	5.50	0.48				17	0.59		195	212	2,885		2,673			
Jan. 1, 1910					12.2				145.5						2,259	996.8	
Jan. 1-Feb. 28	9.91	1.60	8.31				259	3.50		1,174	1,433	579	854				
Mar. 1					14.6				143.1						3,113	998.8	
Mar. 1-31	0.38	1.35		0.97			37	6.20		2,031	1,994	207	1,787				
Apr. 1					18.6				139.1						4,900	1,002.5	
Apr. 1-May 31	6.77	5.85	0.92				40	2.30		744	784	893		109			
June 1					18.4				139.3						4,791	1,002.3	

June 1-Oct. 31	15.49	19.10		3.61			89	1.39		475	386	4,732		4,346				
Nov. 1					2.9				154.8						445	987.6		
Nov. 1-Dec. 31	6.60	3.00	3.60			42		3.06		1,086	1,128	489	639					
Jan 1, 1911					7.2				150.5						1,084	992.2		
Jan. 1-31	3.64	0.75	2.89			69		4.70		1,610	1,679	88	1,591					
Feb. 1					13.3				144.4						2,675	997.7		
Feb. 1-Apr. 30	9.49	4.55	4.94			180		5.70		1,881	2,061	152	1,909					
May 1					18.0				139.7						4,584	1,001.9		
May 1-Aug. 31	14.17	16.85		2.68			82	1.42		477	395	3,679		3,284				
Sept. 1					8.4				149.3						1,300	993.2		
Sept. 1-Dec. 31	19.46	8.75	10.71			322		10.19		3,428	3,750	636	3,114					
Jan. 1, 1912					17.5				140.2						4,414	1,001.5		
Jan. 1-Mar. 31	8.39	2.95	5.44			251		7.87		2,520	2,771	481	2,290					
Apr. 1					22.2				135.5						6,704	1,005.7		
Apr. 1-30	5.17	2.35	2.82			153		4.17		1,302	1,455	54	1,401					
May 1					24.5				133.2						8,105	1,007.9		
May 1-31	2.80	3.50		0.70			40	1.26		390	350	395		45				
June 1					24.4				133.3						8,060	1,007.8		
June 1-Sept. 30	17.13	16.60	0.53			27		1.01		318	345	3,042		2,697				
Oct. 1					19.6				138.1						5,363	1,003.4		
Oct. 1-Dec. 31	9.76	5.50	4.26			200		5.09		1,626	1,826	1,197	629					
Jan. 1, 1913					20.8				136.9						5,992	1,004.3		
Jan. 1, 1913					20.8				136.9						5,992	1,004.3		
Jan. 1-31	6.80	0.75	6.05			320		7.60		2,381	2,701	0	2,701					511
Feb. 1					24.7				133.0						8,182	1,008.0		
Feb. 1-28	2.15	0.85	1.30			74		0.62		192	266	414		148				
Mar. 1					24.5				133.2						8,034	1,007.8		2,508
Mar. 1-31	8.90	1.35	7.55			431		7.27		2,248	2,679	23	2,656					
Apr. 1					24.7				133.0						8,182	1,008.0		196
Apr. 1-16	1.19	1.25		0.06			3	0.69		213	210	14	196					
Apr. 17					24.7				133.0						8,182	1,008.0		
Apr. 17-30	1.05	1.10		0.05			3	0.61		189	186	255		69				
May 1					24.6				133.1						8,113	1,007.9		
May 1-Oct. 31	19.75	22.60		2.85			131	2.68		858	727	5,497		4,770				
Nov. 1					15.1				142.6						3,343	999.3		
Nov. 1-Dec. 31	4.74	3.00	1.74			63		3.30		1,090	1,153	745	408					
Jan. 1, 1914					16.1				141.6						3,751	1,000.2		
Jan. 1-Mar. 31	7.17	2.95	4.22			174		6.50		2,120	2,294	829	1,465					
Apr. 1					19.4				138.3						5,216	1,003.1		
Apr. 1-30	5.07	2.35	2.72			130		4.00		1,274	1,404	16	1,388					
May 1					21.9				135.8						6,604	1,005.6		
May 1-31	4.58	3.50	1.08			57		3.20		1,009	1,066	290	776					
June 1					23.4				134.3						7,380	1,006.8		
June 1-Nov. 30	18.13	20.90		2.77			106	0.90		295	189	6,063		5,874				
Dec. 1					9.6				148.1						1,506	994.3		
Dec. 1-31	3.46	1.20	2.26			54		1.20		411	465	0	465					

Table Showing Quantity of Water in Pymatuning Reservoir at Various Dates—Continued.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Period.	Precipitation. Inches.	Evaporation. Inches.	Excess of Precipitation. Inches.	**Excess of Evaporation.** Inches.	Area of Reservoir Surface. Sq. Miles.	**Gain Due to Excess of Precipitation** on Water Surface. Mil. Cu. Ft.	Loss Due to Excess of Evaporation from Water Surface. Mil. Cu. Ft.	Run-off from Land Surface. Depth in Inches.	Area of Land Surface. Sq. Miles.	Discharge from Land Surface. Mil. Cu. Ft.	Net Quantity Entering Reservoir Land and Water Surfaces Combined. Mil. Cu. Ft.	Draft from Reservoir to Maintain Flow at Sharon. Mil. Cu. Ft.	Added to Storage. Mil. Cu Ft.	Taken from Storage. Mil Cu Ft.	Quantity Remaining in Reservoir at Beginning of Period Mil. Cu. Ft.	Elevation of Water Surface. Feet.	Quantity Wasted over Dam. Mil. Cu. Ft.
Jan. 1, 1915					11.1				146.6						1,971	995.8	
Jan. 1-Feb. 28	5.38	1.60	3.78			123		6.02		2,008	2,131	0	2,131				
Mar. 1					16.9				140.8						4,102	1,000.9	
Mar. 1-June 30	8.62	11.55		2.93			93	1.82		609	516	2,865		2,349			
July 1					10.3				147.4						1,753	995.1	
July 1-Aug. 31	11.53	9.00	2.53			68		2.52		856	924	244	680				
Sept. 1					12.7				145.0						2,433	997.1	
Sept. 1-Nov. 30	7.82	7.55	0.27			6		1.69		582	588	2,152		1,564			
Dec. 1					6.1				151.6						869	990.9	
Dec. 1-31	3.18	1.20	1.98			36		1.80		627	663	0	663				
Jan. 1, 1916					9.5				148.2						1,532	994.2	
Jan. 1-31	2.42	0.75	1.67			41		3.35		1,146	1,187	0	1,187				
Feb. 1					11.4				146.3						2,719	997.8	
Feb. 1-29	1.70	0.85	0.85			23		0.80		271	294	268	26				
Mar. 1					12.1				145.6						2,745	997.9	

Quantity of water which would have been in the Reservoir from June 1, 1908, to March 1, 1916, if it had been in existenee during that period and had it been used to maintain a minimum discharge of 450 cubic feet per second at Sharon.



Column 16 of the table gives the quantity of water that would have been in the reservoir at different dates. It shows that assuming the reservoir to have been full on June 1, 1908, it would have filled and some water would have been wasted in 1909 and 1913. In one other year the water would have risen nearly to high water mark, but in the remaining four years it would have been far below high water mark, and in one of the years only half full when at its highest point.

The figures in the column, representing the lowest points in each year, show that there would have remained in the reservoir from 5 to 65 per cent. of the total amount of water which it would hold, but the average quantity left in the reservoir when at its lowest point in each year would have been only 27 per cent. of its full capacity. The fact remains, however, that if the reservoir had been full at the beginning of the period under consideration it would not have been entirely emptied by the assumed draft.

The reservoir would have been only about one-third full on March 1, 1916, the end of the period under consideration, and I am unable to state whether it would have filled or nearly filled in the spring of 1916, as the discharge of the river after March 1, 1916, is not at hand.

The accompanying diagram gives a graphic representation of the fluctuations of the reservoir corresponding to the figures given in Column 16.

Although the computations show that theoretically a minimum flow of 450 cubic feet per second might have been maintained at Sharon from June, 1908, to February, 1916, inclusive, it is doubtful whether as large a quantity could be maintained in actual practice. One important consideration is that it would be impossible to maintain exactly the desired quantity at Sharon on account of the long distance by the river (33 miles) from the Pymatuning Dam. It is also questionable whether it would be advisable to draw the water in the reservoir so nearly to the bottom, and to have it remain so far below high water mark in dry years. Moreover, the period of eight years covered by the study may not represent the driest periods which may occur.

I suggest that it might be a better policy to operate the reservoir to maintain a minimum flow of 400 cubic feet per second at Sharon, and not draw the water in the reservoir to as low a level as is demanded by the larger draft.

Even if this general policy were adopted, a larger quantity of water could at any time be sent down the river for a few months to meet an emergency.

In the computations made the water of Sugar Run has not been considered as a part of the supply to the reservoir. This stream, which has a drainage area of 9.3 square miles, enters the river below the proposed dam but could be turned into the reservoir, increasing its drainage area by 5.9 per cent. If it were demanded that the minimum flow to be maintained at Sharon shall exceed 400 cubic feet per second, it would then be advisable that the water of this run should be diverted into the reservoir.

PYMATUNING DAM

The site of the dam is a very favorable one in that it requires only a low dam of moderate length to create a reservoir having an area of substantially 25 square miles and containing 8182 million cubic feet of water. Nearly all dams to create so great a reservoir are very much larger.

At the west end of the dam rock is found not far below the surface of the ground, and this affords a favorable opportunity for making a rock cut through which the water of the river may be diverted during the construction of the earthen portion of the dam, and for locating a spillway for permanent use.

Not far from the westerly side of the valley the rock dips and goes so far below the surface that it has not been reached by the borings toward the easterly side, although one of the borings extended to a depth of 90 feet.

As it would add greatly to the cost of the dam to excavate to the rock where it is at a considerable depth, it is important to ascertain whether the material overlying the rock is reasonably watertight. Many samples obtained while borings were in progress have been preserved and were shown to me. Most of them appeared to be of watertight material, but they were obtained while drilling holes with a well drilling outfit in which a heavy chisel was used, which crushed the grains of material into fine powder so that although the samples show impervious material they may not be representative of the material encountered by the borings. A few samples not very far below the surface of the ground were obtained by boring with an auger, and some of these showed loose, porous material.

It seems to me desirable, as I stated to you verbally, that more tests should be made of the earth at the dam site to determine whether or not it is reasonably water-tight, and, if not, to ascertain the degree of permeability of the earth at all depths in different parts of the valley, where the rock foundation cannot readily be reached in constructing the dam.

Additional samples of the material are needed, and they should be obtained by a process which will make them properly representative of the material as it exists in the ground. The most satisfactory way of ascertaining the character of the material is by digging test pits, but as this method of exploration cannot be used in all parts of the valley on account of its large cost, the pit digging may be supplemented by boring and taking "dry samples" at different depths while the boring is in progress. Such samples are obtained by stopping the boring operations from time to time and removing from the bottom of the boring all of the material which has been affected by the boring process, then using a suitable apparatus for obtaining a sample of the undisturbed material at the bottom of the hole.

I think it desirable that not less than two test pits be sunk in the bottom of the valley at the dam site and one on the easterly hillside. Those in the bottom of the valley should be carried as low as practicable with a moderate sized power pumping outfit, and the quantity of water which it is necessary to pump from a pit to keep it drained will be important information.

Data as to the percolating capacity of samples collected from test pits can be determined to some extent by inspection, noting the amount of fine material available for filling the voids between the larger particles, or more accurately by having made what is known as a "mechanical analysis" of the material.

Where the borings are made the pipes should be left in until the investigation is completed, and during all of the operations which involve pumping from or into test pits heights of water in these pipes should be carefully observed as the relative height of the water in the different pipes will frequently furnish valuable information as to the percolating capacity of the ground.

It is hardly feasible to state in advance all that is necessary in order to determine whether the earth at a dam site has a percolating capacity so great that it will be necessary to remove it down to the rock, or to some other nearly impervious material overlying the rock, or whether the percolating capacity will be small enough to permit a dam to be designed which will, without excavating to great depths, cut off a considerable part of the percolation and permit the remainder to pass under the dam and rise to the surface without affecting the safety of the dam.

PYMATUNING RESERVOIR

The elevation selected for high water in the reservoir appears to me to be the best one that could be selected, having in view the maintenance of a minimum discharge at Sharon of 400 cubic feet per second. If an attempt were to be made to maintain a minimum discharge of 450 cubic feet per second, there might be an advantage in raising the water two feet higher.

I have examined in a general way the investigations which have been made of the reservoir site, and see no reason why they are not adequate for all present purposes. Some further studies would undoubtedly be required if the work were to be built, but these can be made after the work is authorized.

PRECIPITATION AND STREAM GAGINGS

It seems desirable to continue the precipitation records on and near the drainage area above Sharon, and especially those on and near the drainage area above the proposed Pymatuning Reservoir; also, in connection with this project, to maintain the gagings of the Shenango River at Sharon and at New Castle where the discharge measurements are affected but little, if at all, by ice. The maintenance of a gaging station at Turnerville does not seem to be of much importance, and the results will have little value, unless the method of measurement is changed, and, in addition to the measurement of the height of the river, current meter measurements are taken at very frequent intervals throughout the ice season.

FLOODS

The effect of the reservoir in diminishing floods at Sharon would be very marked. The studies which have been made show that a very large part of the time the reservoir would be below high water mark, and would be capable of retaining all the water which would flow during a flood, so that none would pass over the Pymatuning Spillway to affect the stream at Sharon. This means that on such occasions the quantity of flood water passing Sharon when the flood is at its maximum would be diminished by nearly one-fourth.

Even if the reservoir were full at the time of the occurrence of the flood, as it would have been had it been in existence in March, 1913, its effect upon a flood crest at Sharon would be nearly as great as if it were not full, because most of the flood water up to the time when the crest of the flood has passed Sharon would have been absorbed by storage in the reservoir, and little would have flowed over the spillway. It would be feasible, under such circumstances as those which existed in March, 1913, to obstruct the spillway and store all of the water in the reservoir until the flood had receded sufficiently at Sharon so that the water could be permitted to run from the reservoir without doing damage.

There would be a similar reduction in the flood crest at New Castle and other points below it, but of less proportionate extent than at Sharon.

Respectfully presented,

FREDERIC P. STEARNS,

Consulting Engineer.

APPENDIX NO. III

REPORT UPON PROPOSED JOINT PROJECT FOR REGULATING THE DISCHARGE OF THE SHENANGO AND BEAVER RIVERS AND SUPPLYING WATER FOR THE LAKE ERIE AND OHIO RIVER CANAL.

By

FREDERIC P. STEARNS, Consulting Engineer.

FREDERIC P. STEARNS
CONSULTING ENGINEER
1 Ashburton Place. Boston.

February 20, 1917.

Pennsylvania Water Supply Commission,

Gentlemen:—

You have informed me that in addition to the problem of building a Pymatuning Reservoir of sufficient size for the regulation of the Shenango and Beaver Rivers there is also under consideration the feasibility of building an enlarged Pymatuning Reservoir, supplied with additional water from French Creek, for the purpose of supplying the summit level of the Lake Erie and Ohio River Canal, as well as for the regulation of the rivers mentioned, and you have asked me to consider and report upon the feasibility and adequacy of this project.

On December 20, 1916, I visited your office in Harrisburg and learned what you desired me to do. On December 21 and 22, I was in Pittsburgh with Mr. Chas. E. Ryder, your engineer, much of the time conferring with Mr. Geo. H. Lehman, Chief Engineer of the Canal Board, who explained fully and freely what was proposed with regard to the water supply of the canal, and exhibited a great many plans, maps, reports and other data relating to the canal. He subsequently furnished without delay copies of reports, plans and other data bearing upon the question under consideration. Mr. Ryder has also furnished me with maps and plans of the territory under consideration, and with numerous records of rainfall and stream discharge.

A brief study of the problem of supplying the canal with water showed that French Creek, in connection with the enlarged Pymatuning Reservoir, was by far the best source of supply for the canal, and indicated that there might be no other practicable source or sources for furnishing the full quantity of water which would be needed if the canal were to have a large amount of traffic.

Preliminary studies also indicated that the large amount of storage made available by raising the Pymatuning Reservoir 12 feet above the height required for the regulation of the Shenango and Beaver Rivers, in connection with an adequate supply from French Creek, would be sufficient for all the requirements of the canal for a long time in the future, without drawing water for the canal from any other sources except those which naturally discharge into the canal or into the feeder leading from the Pymatuning Reservoir to the canal, thus making it unnecessary to consider other sources which might be available to supplement the supply to the canal.

My studies have therefore been directed to the means for obtaining an adequate discharge of water from French Creek into Pymatuning Reservoir, and to the amount of water from that source available for canal use by storing it in the enlarged Pymatuning Reservoir.

ORIGINAL PLAN OF CANAL BOARD

The original plan for supplying the Pymatuning Reservoir provided for taking water from French Creek at a dam to be built about 2.5 miles above Meadville at the site of the old Bemus Dam, the new dam to be built to elevation 1092. The feeder leading to Pymatuning Reservoir consisted for nearly the whole distance of an open canal 30 feet wide on the bottom, with side slopes of 1 vertical to 2 horizontal, and a depth of water of 9.5 feet. Provision was made for special covered structures in three places, including a concrete aqueduct 200 feet long at the crossing of Cussewago Creek, a concrete pressure conduit 4000 feet long a mile further down at Kerrtown, and a tunnel 4100 feet long some 2 miles further down the valley of French Creek, where a high hill is encountered.

The gradient is stated to be 0.63 of a foot per mile, except for the last 1.5 miles where there is a descent of about 60 feet to the Pymatuning Reservoir level. This appears to be the average gradient, and allowing for the steeper gradient through the covered masonry sections the gradient in the open canal appears to be about 0.53 of a foot per mile. At the upper end of the channel, when the depth is 9.5 feet, the water is substantially at the level of the crest of the Bemus Dam.

No reservoir was provided on French Creek other than the small pond above Bemus Dam, and hence there would be many occasions when the discharge of the river would be too small to fill the channel, and at every considerable rise of the river water would run to waste over the Bemus Dam because there would be no reservoir to contain it.

The discharging capacity of the channel was said to be 1000 cubic feet per second, a computation which must have been based upon its capacity without ice upon its surface, because upon recomputing the capacity under such conditions I made it somewhat less than 1000 cubic feet per second.

In the winter, when the channel would be covered with ice much of the time, the capacity would be greatly diminished. The effect of the ice is two-fold, as with a given height of water the ice diminishes the area of the water section and increases the frictional surface in contact with the flowing water so as to materially reduce the velocity with which the water passes through the channel. If the water in the channel were to flow all winter with little fluctuation, the ice would form an unbroken sheet from one side to the other, but if the quantity of water flowing were very variable, as it would be without reservoirs

on French Creek, the ice near the sides would be broken up as the water rises and falls and would become rough and uneven, causing greater frictional resistance than if the sheet were unbroken.

It is impracticable to make accurate computations of the discharging capacity of a channel under winter conditions, but I have made computations which indicate that if the ice extends a foot below the water surface when the depth of water in the channel is 9.5 feet, the capacity will be reduced to from 500 to 600 cubic feet per second In making these computations I did not take into account the ice jams which would be likely to occur in a channel in winter, if there were no dams across it at intervals to prevent the water from dropping to a low level.

The flow line of the Pymatuning Reservoir, by the original plan, was to be raised to elevation 1020, 12 feet above the height required for the regulation of the rivers below it, and this is the same height that is now under consideration.

Extended computations, based upon the plan above described, show that it would not furnish a sufficient water supply for the canal.

NEW PLAN TO BE USED AS BASIS FOR COMPUTATIONS

It may be well to state at the outset that a great many modifications of the original plan for taking water from French Creek might be considered. The Chief Engineer of the Canal Board has ascertained that it is feasible to build four or more large reservoirs on the main stream and its branches above the proposed point of diversion, which would provide additional storage and serve to maintain a more constant flow through the feeder. The reservoir farthest downstream on the main creek, known as Reservoir A, is one of those investigated by the Pittsburgh Flood Commission in connection with the prevention of floods.

It is clear that the point of diversion of water for canal purposes must be above Meadville, substantially at the site of the Bemus Dam, but it is feasible to divert also the waters of Cussewago Creek, about a mile distant from Bemus Dam, by the construction of a dam across that creek in accordance with the plans made by the Pittsburgh Flood Commission, so as to materially increase the drainage area contributing water to the canal.

The computations required in order to determine the amount of water available for canal purposes are very extended, and to make them for a great variety of plans would involve much time and expense. I will therefore outline a definite plan to be used as a basis for the detailed computations, and will subsequently show approximately the effect of various modifications of this plan.

FEEDER TO PYMATUNING RESERVOIR

The open channel of the feeder is to be enlarged so that it will carry 1000 cubic feet per second during average winter conditions. I do not know whether the local conditions are such that it would be better to widen the channel without increasing the depth of water, or to maintain the present bottom width and increase the depth, but have assumed for purposes of computation that the depth of water would be increased 2 feet, making it 11.5 feet, and that the gradient would be increased from 0.53 to 0.83 of a foot per mile.

If the flow line of the channel at its upper end were maintained at the elevation originally planned, the increase in the gradient from 0.53 to 0.83 of a foot per mile would depress the water surface where the feeder passes the outlet of Conneaut Lake 3.7 feet, so that it would cross this outlet about 6 feet instead of 10 feet higher than the lake level.

If the flow line of the channel at its upper end were to be raised 1 or 2 feet, which seems to be feasible in connection with the proposed raising of the crests of the Bemus and Cussewago dams as described below, there would be a corresponding raising of the bottom of the channel where it crosses the outlet of Conneaut Lake and in the somewhat deep excavation beyond the lake.

In order that the channel may be made safe and effective for winter use, it is proposed to build dams across it about every three miles, rising 9 feet above the bottom, and having a total length of spillway of 400 feet. The depth of water over these dams when the feeder is full would be 2.5 feet, and the cross-sectional area over them $400 \times 2.5 = 1000$ square feet. Hence, in the winter time with 1000 cubic feet per second flowing through the feeder, the velocity over the dams would be only 1 foot per second and there would be no appreciable drop at the dams.

To make a straight dam 400 feet long across the feeder would require a very great widening which can be avoided by making the dams in the shape of a letter W, with the bottom of the letter upstream. Such dams can be constructed economically, with only a slight widening of the feeder. With such dams in place when the discharge is very small, or if it is entirely interrupted for a short time, the water would stand in a series of pools nearly level with the tops of the dams and the back water from each dam would maintain a depth of water of 6 feet or more at the next dam above. Under such conditions, if water were to be let into the feeder in large quantities when its surface was covered with ice, it would lift the ice and not carry it downstream. The currents created would be so small as not to involve any danger of creating ice jams, and with proper designing there would be no danger of any considerable quantity of ice passing over the submerged dams.

I have built and operated an open channel in a cold climate designed on substantially the lines above described, with a discharging capacity of 500 cubic feet per second, and the ice has never given trouble. The conditions differ only in this respect, that the water feeding this channel comes from a reservoir where the water has a temperature of 3 or 4 degrees above the freezing point in winter, instead of from a river where the water will be at the freezing point.

The feeder, if designed to carry 1000 cubic feet per second under average winter conditions, would carry about 1620 cubic feet per second when there is no ice, after taking account of the slight obstruction caused by the submerged dams, amounting to 0.02 of a foot per mile. With this quantity running, however, the mean velocity of the water passing through the feeder would be 2.66 feet per second, which might be sufficient to cause the erosion of the earth of the feeder if it is not protected.

I do not know enough about the materials available for building the feeder to know whether or not this mean velocity would cause erosion, but for purposes of computation I have assumed that flashboards 18 inches in height would be put on the submerged dams after the ice has disappeared, so as to check the velocity by causing a drop of rather more than a foot at each dam. By following this plan the discharge would be decreased to 1200 second feet, in the unfrozen feeder, and the mean velocities would range from about 2 feet per second just above each dam to 2.33 feet per second at the upper end of each pool.

It is clear that the diminution in capacity due to the ice cover is not constant throughout the winter. It is least when the ice first forms and much greater after the ice attains a greater thickness and becomes roughened on the under side near the sides of the canal. The discharging capacity is greater if the canal is kept discharging at a nearly constant rate than if there are large variations in the quantity of water carried, but to take account of all such changes would make the computations altogether too complicated. I have therefore assumed that the feeder will have a discharging capacity of 1000 cubic feet per second from December 16 to March 31, inclusive, and of 1200 cubic feet per second for the remainder of the year, this 1200 cubic feet per second being capable of increase to 1620 cubic feet per second if the banks of the feeder are so made that they will not be eroded by the current due to the larger quantity.

DIVERSION DAMS ACROSS FRENCH AND CUSSEWAGO CREEKS

The diversion dam provided for in the original plan is the Bemus Dam across French Creek, having a crest elevation of 1092. The Pittsburgh Flood Commission report shows that it is feasible to build also a dam at the same elevation across Cussewago Creek at about the

same distance above Meadville as the Bemus Dam, and less than a mile from it.

The drainage area above Bemus Dam is 693 square miles. The drainage above the proposed dam on Cussewago Creek is 92 sqnare miles. By taking both of these streams, there are available 785 square miles of drainage area for supplying water to the feeder. It seems highly desirable that in building such expensive works as are proposed that advantage should be taken of all readily available resources.

DISCHARGE INTO CREEKS AT DIVERSION DAMS FOR DOMESTIC, SANITARY AND INDUSTRIAL PURPOSES

Meadville (population in 1910, 12780) is situated a short distance below the proposed diversion dams and is the only place of importance on the stream down to the town of Franklin (population in 1910, 9767), which is located at the junction of French Creek with the Allegheny River, where the drainage area of French Creek below the proposed diversion dams is 500 square miles.

If the town of Meadville should grow to have a population of 100,000, its requirements for water for domestic purposes would be met with about 15 cubic feet per second. Its possible needs for industrial purposes are not known to me, but I was connected with the construction of an industrial water supply for the Cambria Steel Company at Johnstown which had a capacity of about 115 cubic feet per second, and this represents approximately the requirements of a very large steel plant.

With regard to the quantity of water needed for sanitary purposes, I do not think of any sanitary use for the creek water other than the dilution of sewage, and if it were permissible for the town of Meadville to discharge its unpurified sewage into the stream if water were not diverted, and not permissible to do so if the water were diverted, it is much better that payment should be made for injury to sewage facilities than that water should be discharged down the stream for this unimportant use, if needed for the canal.

I will not attempt to decide how much water should be permitted to pass down the river channel at Meadville, but for purposes of computation will assume the quantity to be 100 cubic feet per second during the colder months from December to April, inclusive, and 150 cubic feet per second during the remainder of the year when it would be warmer and more water might be required.

RESERVOIRS ON FRENCH CREEK DRAINAGE AREA

The discharge of any stream is subject to great fluctuations. There are sudden rises of a river after heavy rains, especially after those that occur in the winter and spring, and at other times when the

ground is well saturated, and after warm weather in winter when there is snow on the ground to be melted. Sometimes vast volumes of water are discharged in a few days during great freshets, and it is obvious that without reservoirs a great deal of water is wasted, as the amount of water taken through a feeder is very small in comparison with the discharge of a stream at such times.

Even in a case like the present one, where there is an immense reservoir into which the feeder discharges, it is desirable that there be reservoir capacity also upon the drainage area, chiefly for the purpose of storing temporarily these large river discharges so that they can be held for a time and subsequently discharged gradually through the feeder when it has surplus capacity. It is obvious also that reservoir capacity for this purpose is much more effective if provided near the diversion dams than if provided at points a considerable distance up the streams.

There is an opportunity for a storage reservoir of considerable size on the main stream, 3 miles below Kimmeytown, which is known as Reservoir A on plans prepared by the Chief Engineer of the Canal Board, and is illustrated and described as Reservoir Project 16 on page 103 of the report of the Pittsburgh Flood Commission. The capacity of the reservoir is 2126 million cubic feet, and the drainage area above the dam 216 square miles, equal to 31 per cent. of the drainage area above the Bemus Dam. For the purpose of making detailed computations, I have assumed that this reservoir will be built.

It has already been indicated that it is very desirable to have reservoir capacity near the diversion dams, even if the reservoirs are not of large size, because they will retain the discharge during small rises in the creek, avoiding the waste of water and equalizing the flow through the feeder. I am informed, however, that it is impracticable to raise the dam at Bemus to any great extent, as space must be left for the discharge over the crest without backing the water up on Saegerstown, located about 4 miles above the dam. It would seem, however, to be feasible to raise the crest level of the Bemus Dam 3 feet, or possibly more, by increasing the crest length from 400 feet as proposed to at least double this length, so that the freshets could discharge over the longer and higher crest without increasing the maximum height to which water rises during floods. If the width of the reservoir will not permit the building of a straight crest of this length, it can be obtained by building the dam in the form of a V or W.

The reservoir which it is feasible to build on Cussewago Creek, with a dam at elevation 1092, according to the report of the Pittsburgh Flood Commission, page 102, has a surface area of 3.5 square miles, and it is stated in the report that the dam can be raised to a greater height up to elevation 1100.

If both the Bemus and Cussewago dams were raised to elevation 1095, and a large open channel were constructed between the reservoirs on French and Cussewago creeks, just above the dams, the Cussewago Creek Reservoir could be used in connection with that formed above Bemus Dam for equalizing purposes. The available storage in Cussewago Reservoir above elevation 1092 would be 310 million cubic feet. The amount on French Creek is not known, but for purposes of estimate it will be assumed to be one-fourth of that on Cussewago Creek, making the total available capacity above elevation 1092 390 million cubic feet. In addition to this storage capacity available when the water in the canal is running full depth, there is an additional 330 million cubic feet which could be drawn from these reservoirs when the water in the upper end of the feeder is drawn down to elevation 1088, making the total available storage capacity of these reservoirs 720 million cubic feet.

DISCHARGE OF FRENCH CREEK

The discharge of French Creek has been measured at Carlton since April, 1908, and at Kimmeytown since May, 1910. The discharge of Cussewago and Sugar Creeks, tributaries of French Creek, has also been measured since May, 1910.

It might be supposed that these measurements of French Creek and its tributaries would afford the best basis for determining the discharge per square mile of the drainage area above the diversion dams, but this is not necessarily the case, and since it is the utmost importance in the case under consideration that a trustworthy discharge of the streams should be determined, the subject of stream discharge will be discussed at some length.

The usual method of determining the discharge of a stream, and the method adopted in substantially all of the measurements under consideration, provides for measuring and recording the stage or gage height of the stream one or more times a day, and determining the quantity of water discharged by means of a discharge curve or table which shows the discharge corresponding to different gage heights. The discharge curve or table is based upon actual measurements of the discharge made at various stages of the stream by the use of a current meter or otherwise. The gage heights are generally taken by persons living near the stream at the place of observation, who are engaged to do the work. The discharge measurements are made by engineers, and technical men are also employed to compute the discharges from the gage heights.

As a rule, the results obtained are nearly correct for the portion of the year when the stream is not affected by ice, but there are exceptions where the conditions are unfavorable for correct discharge measurements by this method, and where the discharge curve or

table is based on only a few measurements and therefore is not well determined.

When there is ice to affect the measurement, this method of determining stream discharge is likely to give very erroneous results, because of the very great effect of the ice upon the discharging capacity of a stream at any given height, as has already been stated in considering the summer and winter discharge through the feeder leading from French Creek to the Pymatuning Reservoir.

There is another and entirely different way of determining the discharge of streams. It is well known that stream flow has its source in the precipitation which occurs in the form of rain and snow upon the area from which the water drains toward the stream. There are some abnormal cases of small drainage areas where a part of the precipitation may find its way through underground passages to streams in other drainage areas, but it is unnecessary to consider this feature in the present case, and the stream flow may be assumed without error to be derived wholly from the precipitation upon the drainage areas of the respective streams. Omitting from consideration unimportant factors such as the absorption of water by plant growth during the growing season, the broad statement may be made that the stream discharge is that part of the precipitation which is not lost by evaporation into the air.

During the colder months, and especially in the winter when the precipitation is in the form of snow, the evaporation is small in comparison with the precipitation, so that a large part of the water which falls in the form of snow or rain ultimately finds its way into the streams. There is also at this time of year little difference in the proportion of the precipitation which runs off from drainage of different characters, as one may neglect the difference due to whether the areas are cultivated or not, steep or flat, and even may neglect the difference between swamps and upland because the swamps are generally frozen and covered with snow, so that they present the same evaporating surfaces as other portions of the drainage area.

As an approximate statement it may be said that during the months from December to April, inclusive, about three-fourths of the precipitation finds its way into the streams during that period. During the remainder of the year and especially during the summer months, the evaporation is much greater and the character of the drainage area affects the amount of evaporation and consequently the proportion of the precipitation which finds its way into the streams. From the water surfaces, including wet swamps, there is generally more evaporation than precipitation, and even from the upland the evaporation is very much larger than during the colder months. In many cases small rains merely dampen the ground near the surface without any water running off, and the water is soon evaporated so

that it has little effect upon stream discharge. As a rule the warm weather discharge is a small and uncertain percentage of the precipitation.

Exceptions to this rule, however, occur when there are continuous rains far exceeding the amount of evaporation, and when there are extremely heavy rains which cause the water to flow immediately off the surface of the ground in great quantities, causing summer floods. An instance of this kind on the French Creek drainage area occurred in the early part of August, 1915, when there was a so-called cloudburst, causing destructive floods in the city of Erie, Pa.

To sum up this statement as to the determination of stream discharge from precipitation, it may be said that during the colder part of the year a result may be obtained that is sufficiently trustworthy, although less satisfactory than a trustworthy record of the daily stream discharge, but that in the warmer part of the year stream discharge based upon precipitation alone would be rather speculative and much less satisfactory than the discharge determined by stream measurement.

In the present case it is fortunate that there is one measurement of the stream discharge in this vicinity during the winter months which appears to be trustworthy and is not affected by ice. I refer to the measurement of the discharge of the Shenango River at Sharon, where the water is used by the steel mills and is warmed to such an extent that ice does not form on the river. It is therefore possible in this case to use as a basis for the discharge of French Creek the stream discharge per square mile of drainage area as determined from the measurements at Sharon. The trustworthiness of these results and their applicability to the French and Cussewago Creek drainage areas above Meadville will be considered before discussing the discharge for the months from May to November, inclusive, when there is no ice.

As a test of trustworthiness of the Sharon measurements during the cold weather period from December to April, inclusive, a table follows which shows the relation between the precipitation and the discharge at Sharon, the latter represented by inches of run-off.

Precipitation and Discharge at Sharon, December to April, Inclusive.

Year.	Precipitation on Drainage Area Above Sharon. Inches.	Run-off at Sharon. Inches.	Per Cent. of Precipitation Represented by Run-off.
1909-1910	15.94	10.33	65
1910-1911	16.50	11.58	70
1911-1912	18.37	14.71	80
1912-1913	22.97	17.69	77
1913-1914	15.32	11.72	76
1914-1915	12.44	8.57	69
1915-1916	16.07	13.26	83
Averages	16.80	12.55	75

The average result for the seven years represented by the table is that the discharge of a stream during the period from December to April, inclusive, is 75 per cent. of the precipitation on the drainage area, which is about the proportion determined by past experience with other drainage areas in cold climates. The different years give results varying from 65 to 83 per cent. of the precipitation, which is not a larger variation than may be reasonably expected, as the conditions affecting evaporation are not entirely uniform from year to year. The comparison indicates that the Sharon measurements are trustworthy.

The corresponding relation between the precipitation on the French Creek drainage area and the recorded discharge at Kimmeytown and Carlton will now be presented, to show why I have rejected these records as a basis for the discharge of French Creek during the colder months.

Precipitation and Discharge, French Creek Drainage Area, December to April, Inclusive

Year.	Precipitation on Drainage Area of French Creek. Inches.	Discharge as Recorded. Inches.	Per Cent. of Precipitation Represented by Discharge.
At Kimmeytown.			
1910-1911	16.62	25.25	152
1911-1912	18.37	22.41	122
1912-1913	23.47	28.83	123
1913-1914	15.95	19.47	122
1914-1915	12.87	15.22	118
1915-1916	17.77	25.05	141
Averages	17.51	22.71	130
At Carlton.			
1909-1910	16.89	14.18	87
1910-1911	16.62	17.46	105
1911-1912	18.37	18.28	99
1912-1913	23.47	22.97	98
1913-1914	15.95	15.15	95
1914-1915	12.87	11.72	91
1915-1916	17.77	19.61	110
Averages	17.35	17.05	98

The Kimmeytown table shows that the recorded discharge at that place is far in excess of the precipitation, a result which is impossible. At Carlton also the discharge represents a larger percentage of the precipitation than would really exist. Hence, the results should not be based on these discharges for the cold months.

Having rejected the direct measurements of French Creek during the colder weather, the question which needs to be considered is what modifications, if any, are necessary to make the Sharon discharge per square mile applicable to the French Creek drainage area.

In the first place, it is obvious that if there were a difference in the amount of precipitation on the two drainage areas during this portion of the year, there would be a difference in the amount of water discharged by the streams. A comparison of the amount of precipitation on the drainage areas is as follows:

Precipitation on Shenango River and French Creek Drainage Areas, December to April, Inclusive, In Inches

Year	Shenango River at Sharon.	French Creek at Meadville.	Per Cent. Excess at French Creek.
1908-1909	19.52	20.92	7
1909-1910	15.94	16.39	3
1910-1911	16.50	16.62	1
1911-1912	18.37	18.37	0
1912-1913	22.97	23.47	2
1913-1914	15.32	15.95	4
1914-1915	12.44	12.87	3
1915-1916	16.07	17.77	11
Averages	17.14	17.80	4

The table shows a close relation between the precipitation on the two drainage areas, that on the French Creek area ranging from 0 to 11 per cent. larger and averaging 4 per cent. larger than on the other. It is probable that the discharge from the French Creek drainage area during this portion of the year is as much as 5 per cent. in excess of that of the Shenango River area, as the evaporation does not increase as much as the precipitation.

There is another point to be considered which does not affect the total discharge during the winter months, but does affect its distribution and is therefore important in the present case, namely, the respective frequency with which the streams rise during the winter as the result of rain or melting snow. It is easy to conceive that the temperature on one drainage area might be so much lower than on another that more of the precipitation would occur in the form of snow, and the snow would remain on the ground for a longer time, causing a high discharge of the streams in the early spring rather than a distributed flow throughout the winter. In the former case the discharge would not be nearly as effective for supplying a feeder as if the discharge were more uniformly distributed.

A comparison of the daily discharges of the two rivers from 1910 to 1916, inclusive, shows that there are equally frequent increases in the discharge in winter due to rainfall or melting snow and that there is no material difference between the streams in this respect. The rises usually occur on the same day, or not more than one day apart.

As a result of these studies I have concluded to use the daily discharges per square mile of drainage area at Sharon as a basis for determining the discharge of French Creek, and to be on the safe

side have not increased these discharges by reason of the probable 5 per cent. greater discharge of French Creek.

Reverting now to the discharge during the months from May to November, inclusive, there are reasons why the discharge per square mile of drainage area at Sharon should not correspond with the discharge of French Creek. These are that the precipitation from May to November, inclusive, is greater on the French Creek drainage area, and the evaporation is probably much less because the French Creek area does not have upon it evaporating surfaces of such extensive swamps as are found on the Shenango River drainage area above Sharon, including the extensive Pymatuning Swamp on the main river, and other extensive swamps on the Pymatuning Creek and Little Shenango drainage areas. Moreover, there is no reason to obtain the discharge during the summer months by inference, if the direct discharge measurements of French Creek can be shown to be sufficiently correct during this season of the year.

The difference between the precipitation on the Shenango River and French Creek drainage areas during the months from May to November, inclusive, is shown by the following table;

Precipitation in Inches, May to November, Inclusive

Year.	Shenango River Drainage Area.	French Creek Drainage Area.
1908	11.28	13.57
1909	17.64	20.31
1910	22.18	25.37
1911	29.44	31.48
1912	25.84	25.85
1913	22.69	23.66
1914	22.24	22.56
1915	26.10	31.71
1916	20.35	22.59
Averages	21.97	24.12

Another table which follows gives a comparison of run-off in inches of depths upon the drainage areas of various streams in northwestern Pennsylvania and vicinity during the period from May to November, inclusive, with a view of indicating such differences as exist in the discharge of the different streams.

French Creek at Carlton, as has already been stated, has been used as a basis for computing the discharge of the streams at the diversion dams above Meadville, and this discharge has therefore been assumed to be 100 per cent. in determining the relative discharge of the other drainage areas for corresponding periods.

Comparison of Run-off, May to November, Inclusive, of Streams in Northwestern Pennsylvania and Vicinity, in Inches on Drainage area.

Year.	Pymatuning Creek Below orangeville.	Shenango River at			Little Shenango River at Greenville.	French Creek at		Cussewago Creek near French Creek.	Sugar Creek near French Creek.	Allegheny River at	
		Turnerville.	Sharon.	New Castle.		Kimmeytown.	Carlton.			Kittanning.	Red House N. Y.
1910	---------	---------	3.65	3.87	---------	11.51*	7.69*	8.84*	5.76	6.64	8.19
1911	---------	---------	8.50	8.01	---------	12.64	10.74	10.37	7.26	12.38	10.37
1912	---------	6.36	6.22	5.86	---------	15.14	9.29	6.23	4.41	10.35	8.40
1913	---------	5.84	3.74	4.05	---------	8.19	6.45	5.70	7.08	7.43	5.84
1914	4.19	4.65	3.97	4.12	4.65	7.19	5.58	4.73	6.68	6.10	5.82**
1915	3.58	4.93	4.29	4.34	7.85	15.30‡	11.99‡	8.08	10.75‡	6.82*	---------
1916	---------	2.67	2.31	2.19	---------	6.37	5.22	3.49	---------	---------	---------
Relative Discharge:	44	63	57	57	71	134	100	83	81	96	97

* One month interpolated.
** October and November, 1914, assumed same as Kittanning.
‡ Discharge for this year was unusually high on account of the abnormal rainfall in August, which caused destructive floods at Erie, Pa.

A comparison of the average results shows that the Carlton discharge is but little more than the corresponding discharge of the Allegheny River at Kittanning, where there is apparently a good measurement of the run-off from a drainage area similar in elevation and in the precipitation upon it to that of French Creek. A similar result is shown by a comparison with the discharge of the Allegheny River at Red House, N. Y.

The measured discharge at Kimmeytown, even for the months when there is no ice, is a third larger than that at Carlton and appears to be excessive. The results obtained at Cussewago and Sugar Creeks are about four-fifths of those at Carlton, but it is quite possible that the discharge from these drainage areas in the summer time is somewhat smaller than the average from the drainage area above Carlton; moreover, it is more difficult to obtain an accurate measurement of small streams by the methods used than of larger ones.

On the whole, the measurements of streams east of the Shenango River give a fair amount of support to the Carlton measurements, and it can hardly be said, in view of the difference in precipitation and the larger proportion of run-off to be expected from the larger rainfall and the summer evaporation, that the results of the measurements of the Shenango River and its tributaries throw any serious doubt upon the trustworthiness of the Carlton warm weather measurements. It would be my judgment that they should be decreased, rather than increased, but they are not high enough to warrant making any deduction especially as the estimates for the colder portion of the year have been made on a basis probably 5 per cent. below the actual run-off.

The run-off at Carlton during the period covered by the table represents 30 per cent. of the precipitation, leaving 70 per cent. as the loss by evaporation.

MILL AND MOSQUITO CREEKS

In addition to the water supply obtained from French Creek, with the aid of the Pymatuning Reservoir, Mill Creek forms a part of the feeder leading from Pymatuning Reservoir to the summit level of the canal. Its water is necessarily mingled with the water of the feeder, and unless there is a demand for the continued discharge of both flood and ordinary discharges into Mill Creek below the diversion dam, it will furnish some water for the supply of the canal. The drainage area at the proposed diversion dam is 45 square miles.

One portion of the summit level of the canal is created at least in part by damming Mosquito Creek at a point where the first lock at the southerly end of the summit level is located, and this creek, having a drainage area of 97 square miles, necessarily contributes its water to the summit level of the canal. The total drainage area of these two contributing creeks is therefore 142 square miles.

In addition to this direct, or nearly direct, source of supply for the canal, it seems probable that it will be advisable to intercept the discharge of several small streams flowing westerly across the summit level of the canal, and a still further supply for the canal might be obtained by intercepting the head waters of the branches of Ashtabula River.

The combined drainage areas of the streams flowing westerly across the canal location, including all streams from Colebrook on the south to a point 1.5 miles beyond Plum Creek on the north, is 33 square miles, and of the head waters of the branches of the Ashtabula River which might be intercepted 27 square miles, making a total additional drainage area of 60 square miles. For the purpose of computation I have assumed that these streams will not furnish a supply to the canal.

The plans for the canal provide for a reservoir on Mill Creek holding 467 million cubic feet. It is also stated that to fill the summit level of the canal, if it is drawn off, would require 515 million cubic feet.

Mill and Mosquito Creeks will furnish in the late winter and spring, before the navigation season begins, the water required for filling the Mill Creek Reservoir and for filling the summit level of the canal if either of these shall have been emptied during the winter. These streams also will furnish all water required during the closed season to cover all losses due to leakage, evaporation and percolation, so that the draft on the Pymatuning Reservoir for canal purposes, under any ordinary circumstances, will not begin until the navigation season opens.

It is possible, as an exception to the rule, that the summit level might be kept unfilled until very near the date of the opening of the navigation season, so that in order to fill it in the shortest possible time some water would be required from the Pymatuning Reservoir. This is not likely to occur except at such rare intervals that it seems unnecessary to take account of any draft from Pymatuning Reservoir for this purpose.

QUANTITY OF WATER REQUIRED FOR CANAL

I have not attempted to make any independent estimate of the quantity of water required for the canal, but for the purpose of computation have accepted the estimates of Mr. John P. Newton of the requirements of a canal 15 feet deep and with 180 feet bottom width, using double locks 400 x 56 feet and assuming 76 lockages per day. His quantities for the navigation season are as follows:

	Million Cubic Feet.
Filling prism,	515
Evaporation, percolation and absorption,	309
Leakage at aqueducts and culverts,	214
Flow over waste weirs,	107
Leakage through lock gates and valves,	1553
Lock operating machinery,	1316
Electric lighting,	391
Lockage,	9122
Total,	13527
Mean cubic feet per second,	732

Mr. Newton's estimate is based upon a season of 214 days. Excluding the filling of the prism, because this must come before the navigation season, the demands during the season are 704 cubic feet per second. This quantity per second for 214 days amounts to 13,012 million cubic feet.

Instead of using 214 days I have used 229 days, so as to cover the period from April 16 to November 30, inclusive, and 704 cubic feet per second for this longer period amounts to 13,930 million cubic feet, which, without including the filling of the canal prism, is somewhat more than his total quantity for the season. The requirement of 704 cubic feet per second is made up of the following items:

	Cubic Feet per Second.
Evaporation, percolation and absorption,	17
Leakage at aqueducts and culverts,	12
Flow over waste weirs and leakage through locks, gates and valves,	90
Lock operating machinery and electric lighting,	92
Lockage,	493
Total,	704

It seems possible and desirable to eliminate the 92 cubic feet per second, equivalent to 1,707 million cubic feet per season, required to produce power for lock operating machinery and electricity for lighting, by establishing a central hydro-electric plant at the Mill Creek Dam to furnish such power. There is necessarily a continuous discharge of water at this dam for supplying the summit level of the canal, and ample electric power could be created by the fall of such water, thus diminishing the canal requirements by the amount above stated. Auxiliary plants could be provided at two or more of the locks, to furnish power in case of accident to the central plant or other emergency, but such auxiliary plants would be operated so little as not to make any important demand upon the canal supply. Although the supply required may be diminished in this way, I have not made any deduction on this account from the 704 cubic feet per second based on Mr. Newton's estimate.

STORAGE CAPACITIES OF PYMATUNING AND OTHER RESERVOIRS

For the purpose of regulating the flow in the Shenango and Beaver Rivers, the height contemplated for the Pymatuning Reservoir is elevation 1008, and the capacity of the reservoir at this elevation according to the latest information is 8570 million cubic feet, all of which would be available in case of necessity for discharge into the river below the dam.

Raising the reservoir 12 feet to elevation 1020 adds to this capacity 10,870 million cubic feet, making a total of 19,440 million cubic feet, but as the feeder leading toward the canal is higher than the bottom of the reservoir there becomes unavailable substantially 1440 million cubic feet of bottom water, which diminishes the total available capacity of the reservoir to 18,000 million cubic feet. The net addition to the *available* capacity is therefore 9430 million cubic feet.

It might seem from this computation that the only storage available for canal purposes would be the 9430 million cubic feet added to the available storage, but the combined system can be operated to the advantage of both interests so as to make the storage available for canal purposes much more than this quantity. The reason for this is that so large a quantity of storage as 8570 million cubic feet is necessary for the independent project of regulating the flow of the Shenango and Beaver Rivers only because of the comparatively small drainage area supplying the reservoir. The discharge from this area will not fill the reservoir each year, and consequently there has to be sufficient storage to equalize the discharge over a series of dry years, while with a larger supply to the reservoir which would be made available by constructing adequate works for diverting water from French Creek the filling of the reservoir each year would be practically assured. With the reservoir full each spring, less storage

capacity would be required for river regulation and more would be available for canal purposes.

In other words, if those interested in river regulation could be assured that the reservoir would be filled or nearly filled every year, they could advantageously forego a part of the storage capacity of the reservoir, allowing it to be used for canal purposes.

Statistics of Reservoirs Included in Making Computations for Supplying the Canal and Regulating the Flow of the Shenango and Beaver Rivers.

Name of Reservoir	Elevation of Water Surface. Feet.	Area. Sq. Miles.	Total Capacity. Mil. Cu. Ft.	Available Capacity. Mil. Cu. Ft.
Pymatuning	1,020	39.35	19,440	18,000
Reservoir A, French Creek.	1,280	3.56	2,130	2,130
*Cussewago and Bemus Dam, Freneh Creek,	1,095	4.75	1,350	.720
Mill Creek,	947	1.53	470	460
Totals			23,390	21,310

*The statistics of the Cussewago Reservoir were deduced from the report of the Pittsburgh Flood Commission and one-fourth was added to area and capacity to allow for the unknown size of the Bemus Dam Reservoir. Of the 720 mil. cu. ft available capacity in these combined reservoirs, 400 mil. cu. ft. are above the flow line of the feeder leading to Pymatuning Reservoir and therefore are available at all times, while the remaining 320 mil. cu. ft. are contained between the flow line of this feeder and elevation 1088 and hence can be utilized only when the feeder is running at less than its full capacity.

RESULTS OF WATER SUPPLY COMPUTATIONS

Detailed computations have been made and are given in an appendix to this report, showing how the works adopted as a basis for computations could have been operated from April 16, 1909, to December 31, 1916, had they then been in existence. Several years preceding this period were years of high precipitation and run-off, with the exception of the summer and autumn of 1908 which were very dry. It is known, however, from other computations, that all reservoirs would have filled in the spring of 1909.

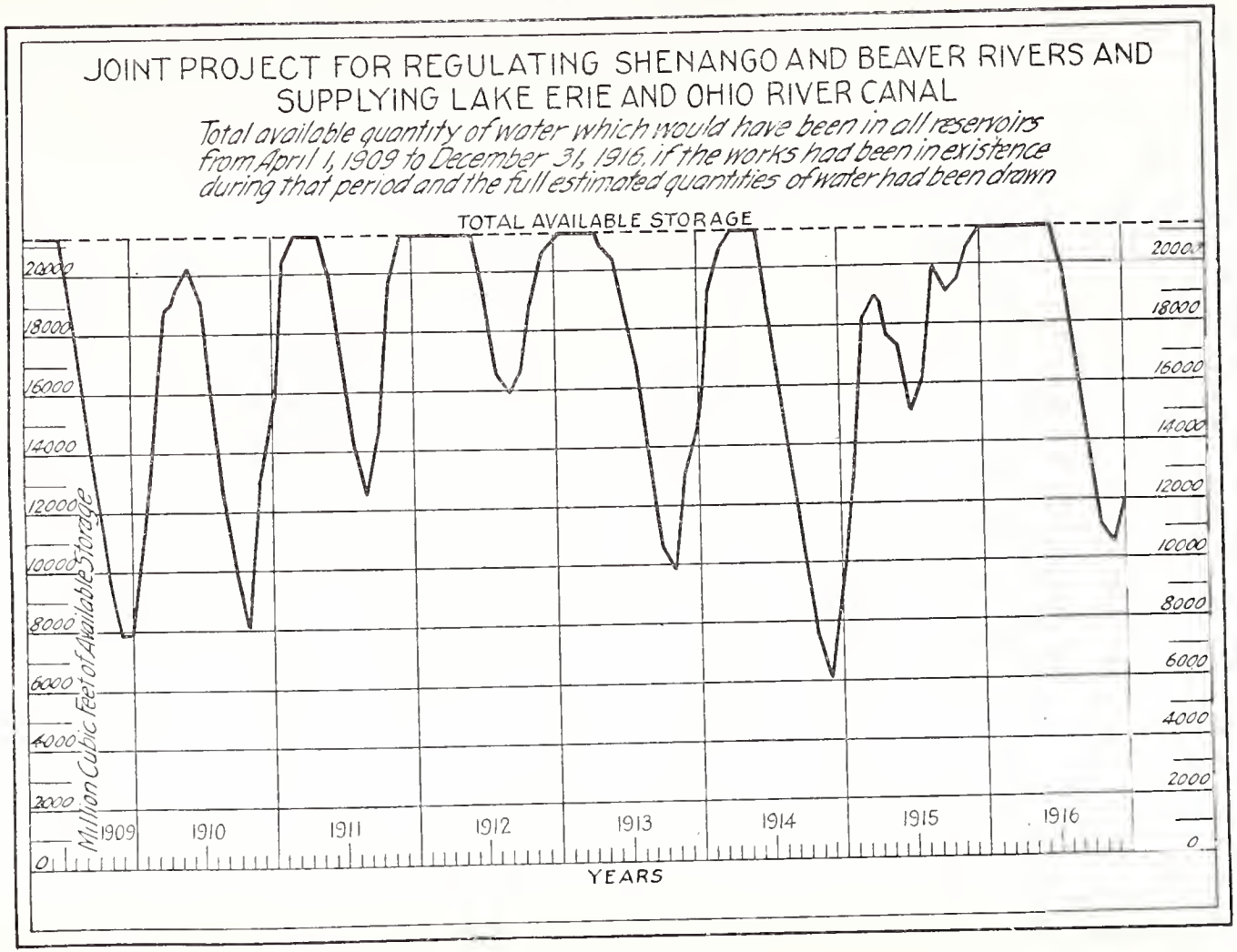
In making the compntation it has been assumed that Mill Creek Reservoir will be kept full at all times. It is, however, available for use in cases of emergency. The main results are as follows:

Pymatuing Reservoir would have filled each year, but in 1910 and 1915 this would have been accomplished only by drawing water from the reservoirs on French Creek so that they would have been only partly filled at the time of the filling of Pymatuing Reservoir. In the other years, not only would Pymatuning Reservoir have filled and remained full for months, but the French Creek reservoirs would also have been full.

The works would have supplied the full quanity required for the canal with 76 lockages per day, and have maintained a minimum discharge of 450 cubic feet per second in the Shenango River at Sharon,

JOINT PROJECT FOR REGULATING SHENANGO AND BEAVER RIVERS AND SUPPLYING LAKE ERIE AND OHIO RIVER CANAL

Total available quantity of water which would have been in all reservo irs from April 1, 1909, to December 31, 1916, the works had been in existence during that period and the full estimated quantities had been drawn.



and at no time would Pymatuning Reservoir have been drawn below the point where it would have contained 5330 million cubic feet of available storage, equivalent to 30 per cent. of the total available capacity in this reservoir.

The maximum and minimum amounts of storage in the reservoirs in each year are given in the following table.

Table Showing Maximum and Minimum Amounts of Available Storage in Each Year, and Dates of Such Storage

	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.
Maximum.								
Dates	To July 1	June 1	Mar. 1 to May 1	Dec. 1 1911 to June 1 1912	Feb. 1 to Apr. 16	Apr. 1 to June 1	Dec. 1	Jan. 1 to July 1
Reservoirs:								
Pymatuning	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Reservoir A	2,130	1,220	2,130	2,130	2,130	2,130	1,490	2,130
Cussewago & Bemus Dam	720	600	720	720	720	720	720	720
Mill Creek	460	460	460	460	460	460	460	460
Total Storage	21,310	20,280	21,310	21,310	21,310	21,310	20,670	21,310
Minimum.								
Dates	Dec. 31	Nov. 1	Sept. 1	Sept. 1	Nov. 1	Dec. 1	July 1	Dec. 1
Reservoirs:								
Pymatuning	7,360	7,650	11,460	15,120	8,490	5,350	14,570	9,310
Reservoir A	0	0	240	0	470	0	0	360
Cussewago & Bemus Dam	0	0	290	270	340	260	20	320
Mill Creek	460	460	460	460	460	460	460	460
Total Storage	7,820	8,110	12,450	15,850	9,760	6,070	15,050	10,450

The total amount of available storage in all the reservoirs for each month of each year is shown graphically on the accompanying diagram.

The table and diagram show that with the canal demand of 13,930 million cubic feet per year, which has been used as a basis for computations, there would be a considerable quantity of water left in the reservoirs when drawn to the lowest point. It may be of interest to note how much more water might have been supplied during the years under consideration if the whole of the available capacity of the reservoirs had been utilized during the most critical periods.

An examination of the table and diagram shows that the most critical period is that extending from July 1, 1909 to November 1, 1910. The amount of available storage left in all the reservoirs on November 1, 1910, was 8110 million cubic feet. As the reser-

voirs would not have filled in the spring of 1910, this additional quantity of available storage must make good any additional canal demand in 1909 as well as in 1910. The number of days when water would have been drawn from storage to supply the canal demand would have been 153 in 1909 and 199 in 1910, making 352 days in all. The additional storage would therefore have amounted to 23.0 million cubic feet per day. This quantity applied for a season of 229 days amounts to 5260 million cubic feet of additional water available per season for canal purposes, making the total available quantity per season 19,190 million cubic feet.

The manner in which the canal could have been supplied with water, if it had existed, and the Shenango and Beaver Rivers regulated during the navigation seasons (Apr. 16 to Dec. 1) from 1909 to 1916, inclusive, by the system of works described in this report and used as a basis for computation, is given in much detail in Table XL. The condensed results are shown in the following table.

Requirements and Supply During Navigation Season (Million Cubic Feet)

	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.
Requirements.								
For canal purposes	13,930	13,930	13,930	13,930	13,930	13,930	13,930	13,930
For river regulation	5,260	5,540	4,260	4,240	6,130	6,380	4,370	5,990
Excess of evaporation over precipitation on Pymatuning Reservoir	440	190	----------	----------	190	70	----------	290
Totals	19,630	19,660	18,190	18,170	20,250	20,380	18,300	20,210
Supply During Navigation Season.								
From Mill and Mosquito Creeks	2,390	1,440	2,680	2,220	1,250	1,490	1,470	1,290
Net yield of drainage area (land surface) of Pymatuning Reservoir	1,670	1,340	2,810	2,130	1,190	1,490	1,240	930
Excess of precipitation over evaporation on Pymatuning Reservoir	----------	----------	460	10	----------	----------	150	----------
From French Creek through feeder	5,000	9,360	12,240	13,810	10,500	4,750	15,440	9,300
Net loss of storage in Pymatuning Reservoir	10,570	7,520	0	0	7,310	12,650	0	8,690
Totals	19,630	19,660	18,190	18,170	20,250	20,380	18,300	20,210
Drawn for use from Pymatuning Reservoir	10,570	10,350	6,540	2,880	9,510	12,650	3,430	8,690

IF A LARGER SUPPLY FOR THE CANAL IS FOUND NECESSARY, HOW CAN IT BE OBTAINED?

PYMATUNING CREEK RESERVOIR

The Chief Engineer of the Canal Board has made estimates, based on surveys, of the capacity and cost of a large reservoir on Pymatuning Creek, where the drainage area is 140 square miles, which might be used to assist in the regulation of the discharge of the Shenango and Beaver Rivers thus in part taking the place of the Pymatuning

Reservoir which could be used to a correspondingly greater extent for the supply of the canal. This appears to be a feasible plan. The drainage area is sufficiently large to have filled the reservoir in the most critical year of the period under consideration, and hence its full capacity of 3,085 million cubic feet would be added to the supply available for the canal each season.

In the 352 days of draft from storage during the navigation seasons of 1909 and 1910, twice the capacity of this reservoir, amounting to 6170 million cubic feet, would have been available. This is equal to 17.5 million cubic feet per day, making available 4,000 million cubic feet per canal season of 229 days.

The estimated cost of this reservoir is $1,546,800.

ADDITIONAL RESERVOIRS ON FRENCH CREEK

The Chief Engineer of the Canal Board has made also preliminary examinations from which he has estimated the capacity and cost of two large additional reservoirs on French Creek, upstream from Reservoir A. These reservoirs are as follows:

	Drainage Area. Sq Miles.	Capacity. Mil. Cu. Ft.	Estimated. Cost.
Reservoir B, 2.5 miles above Wattsburg	92	3,844	$1,923,000
Reservoir C, West Branch, 4 miles above Wattsburg	63	2,409	1,204,500
Totals	155	6,253	$3,127,500

These reservoirs are above Reservoir A, which is left with only 61 square miles of drainage area not tributary to Reservoirs B and C.

All three of these reservoirs would fill in a dry year if no water were drawn from them, but they would not fill in dry years if water were drawn from them to insure the filling of the Pymatuning Reservoir. It is a fact, however, that if care were taken not to draw them too low, they would fill in all ordinary seasons and would be full at the beginning of a critical two-year period.

As already stated, the most critical period extends from July 1, 1909, to November 1, 1910. If Reservoirs B and C had been in existence, they would have been full as late as July 1, 1909, and in the ordinary course of events would have been far enough below high water mark in the spring of 1910 to have held and thus saved 1390 million cubic feet of water that without them would have been wasted from the portion of the drainage area above Reservoir A, between March 1 and 14, 1910.

These reservoirs, therefore, had they been in existence, would have furnished during the 352 days of draft from storage in 1909 and 1910, 6253 + 1390 = 7643 million cubic feet of water, which is equal to 21.7 million cubic feet per day, making available 4970 million cubic feet per season of 229 days.

These computations show that in the most critical period an additional supply of 4,000 + 4970 = 8970 million cubic feet could have been provided by the Pymatuning Creek Reservoir and the two additional reservoirs on French Creek, making a total of 28,051 million cubic feet per season available for canal purposes from the sources considered.

RAISING OF PYMATUNING RESERVOIR

The raising of the Pymatuning Reservoir to a still greater height than elevation 1020 is well worthy of further consideration, as the storage from each additional foot amounts to about 1100 million cubic feet, and the supply available from French Creek would in nearly all years be capable of filling a larger reservoir than that built to elevation 1020.*

I have been told that the further raising of this reservoir would cause some flooding in Linesville, but the cost of acquiring the portion of the town affected by raising the reservoir, or of providing artificial drainage, might be paid without making the cost per million cubic feet of storage in this reservoir as great as elsewhere.

MAHONING RIVER RESERVOIRS

Reservoirs on Mahoning River have been suggested, but to utilize the water from them for the canal would require a long feeder, and the additional supply from this source would probably cost more than from the other sources under consideration which will furnish all the water required.

WILL THERE BE YEARS OF LOWER STREAM DISCHARGE THAN THOSE FROM 1909 TO 1916?

The years from 1909 to 1916, inclusive, were chosen as a basis for detailed computations partly because during this time there are more abundant and detailed records of stream discharge and precipitation than in earlier years, and partly because these years were known to include some unusually dry periods.

One can extend the investigations back to about 1902 on the basis of the discharge measurements of streams in this section of the state, and for many additional years by a study of the precipitation records. From such examination of precipitation† and discharge, the additional critical periods in the last thirty years are found to be those extending from July 1, 1893, to November 1, 1895, and from July 1, 1905, to November 1, 1906. Both of these periods may be compared with the critical period from July 1, 1909, to November 1, 1910.

A comparison of both precipitation and discharge records for the

*See Table No. XLII.

†Precipitation records from 1892 to 1915, inc., are given in Table No. XLVI.

1905-6 period with those for 1909-10 shows clearly that the later period was the drier of the two.

A comparison of the amount and distribution of precipitation from July 1, 1893 to July 1, 1894, shows that all the reservoirs would have filled in 1894, and would have remained full until July 1 of that year. Hence, the conditions were more favorable then than in 1909-10. When a comparison is made between the period from July 1, 1894, to November 1, 1895, and the corresponding period in 1909-10, there is but little difference in the results.

For the purpose of making the comparison, four precipitation stations in the vicinity of French Creek were selected, at which records were available for both periods, and the results are as follows:

Precipitation in Inches

	1894-5.	1909-10.
July to November	16.99	12.09
December to April	11.87	15.82
May to October	17.96	19.37
Totals	46.82	47.19

The table shows that there was slightly less precipitation in 1894-5 than in 1909-10, and the fact that the precipitation in the earlier period was low during the cold months from December to April, inclusive, when there is the smallest loss by evaporation, indicates quite clearly that the total discharge during the former period was less than in the more recent period.

It does not follow, however, that there would have been a smaller available supply for the canal, because much depends in the plan of works under consideration upon the distribution of the discharge, and in the latter part of 1909 and early part of 1910 the distribution was very unfavorable. There was no rise of the streams to cause any large flow through the French Creek feeder into Pymatuning Reservoir until January 19, 1910, as the total amount of water which would have discharged through the feeder from October 1, 1909, to January 19, 1910, is only 1700 million cubic feet. Later in the season, from March 1 to 14, 1910, the discharge of French Creek was very large and the unavoidable waste over the diversion dams would have amounted to 6820 million cubic feet, representing 36 per cent. of the total discharge of the Creek from December to April, inclusive.

As a further indication of the very unfavorable distribution of the discharge in 1910, a comparison with other years in the period under consideration shows that on only one occasion was there as large a discharge in 15 days, and this was at the time of the great freshet in March, 1913. In 1910 the maximum discharge of French Creek at the diversion dams in 15 days was 10,250 million cubic feet,

while in the same number of days in March, 1913, it was 11,100 million cubic feet. Next in order of size is the discharge during 15 days in January, 1913, of 9650 million cubic feet.

The distribution of the precipitation from December to April, 1894-5, was such as to indicate that a larger proportion of the water discharged by French Creek could have been run through the feeder into Pymatuning Reservoir, and probably about as much as could have been run through the feeder in the winter of 1909-10.

Whether or not, with the somewhat smaller total discharge from December, 1894 to April, 1895, an equal or larger amount of water would have run through the French Creek feeder than for the same period in 1909-10 might be estimated by referring to daily records of precipitation and temperature, and these are not available to me. I think it highly probable, however, that the amount of water available during the five months under consideration was as large in 1894-5 as in the corresponding later period, and if this view is correct the larger precipitation in the remaining months of the earlier period would have supplied more than the corresponding months of the later period.

It seems probable that in the last 30 years there has been no period which would have supplied less water for canal uses from the works under consideration than the critical period of 1909-10, or if there has been such a period the deficiency would have been small.

EFFECT OF MODIFICATIONS OF PLAN USED AS BASIS FOR COMPUTATIONS

As already suggested in the earlier part of the report, the plan used as a basis for computations might be modified in various ways and the effect of modifications can be determined approximately without going into detailed computations. Moreover, since the period 1909-10 is the most critical one for the works under consideration, the effect of the modifications may be determined with reference to that particular period.

REDUCING CAPACITY OF FEEDER FROM FRENCH CREEK

If the capacity of the feeder were to be reduced from 1000 to 800 cubic feet per second from December 16 to March 31, while still retaining a capacity of 1200 cubic feet per second for the remainder of the year, the reservoirs would still have been full on July 1, 1909, but from January 19 to March 14, 1910, inclusive, the smaller feeder would have carried into the Pymatuning Reservoir 950 million cubic feet of water less than the larger one.

BUILDING BEMUS AND CUSSEWAGO DAMS TO ELEVATION 1092 INSTEAD OF TO ELEVATION 1095

If the diversion dams were to be built only to the elevation of the high water in the feeder, so that there would be no available storage above the diversion dams except when the feeder was operating at part capacity, the losses during the critical period in 1909-10 would have been 1020 million cubic feet. These reservoirs have an available capacity above the flow line of the canal of 400 million cubic feet, but in the winter and spring of 1909-10 they would have been well filled by two floods and partly filled by another, and emptied after each flood. The aggregate amount of storage on Cussewago and Bemus Creeks utilized during the critical period would have been 1350 million cubic feet.

It is very important that as much storage as is practicable be provided immediately above the diversion dams, as a reservoir at this place may be filled and emptied several times during a single year, thus saving much water that would otherwise run to waste. It does not seem improbable that much more water than I have assumed as a basis for computations may be stored by these dams by increasing their height.

OMISSION OF CUSSEWAGO CREEK

The original plan did not include Cussewago Creek, with its drainage area of 92 square miles. One result of its omission would be the necessary elimination of the Cussewago Creek Reservoir, which has already been shown to be of much importance, but in addition the failure to dam and utilize this creek would diminish the drainage area supplying water to the feeder by 11.7 per cent. In the critical season of 1909-10 this would have diminished the amount of water supply by 1220 million cubic feet.

OMISSION OF RESERVOIR A

Reservoir A, after having been emptied in the summer of 1909, would have filled in the early spring of 1910, storing 2130 million cubic feet of water. At other times in the winter and spring water would have been drawn from it for use, and the quantity so drawn made good by storing water which would otherwise have been wasted, so that the total saving of water attributable to this reservoir is 2750 million cubic feet.

DISCHARGE INTO CREEKS AT DIVERSION DAMS FOR SUPPLY OF MEADVILLE AND OTHER COMMUNITIES BELOW

The computations are based on the arbitrary assumption that 100 cubic feet per second would be permitted to discharge into the creek

bed at the diversion dams from December to April, inclusive, and 150 cubic feet per second during the remainder of the year. If these quantities were to be decreased by 50 cubic feet per second, the increase in the discharge through the feeder during the critical period of 1909-10 would have amounted to 1500 million cubic feet; if they were to be increased 50 cubic feet per second, the decrease in the discharge through the feeder during this period would amount to 1160 million cubic feet.

SUMMARY OF EFFECT OF MODIFYING PLAN

The relative importance of different modifications of the plan which has been used as a basis for computations may be shown by grouping the figures already given as the result of modifications in the direction of the plan originally proposed.

	Mil. Cu. Ft.
Reducing the winter capacity of feeder from French Creek from 1,000 to 800 cubic feet per second	950
Omission of storage provided immediately above the Bemus and Cussewago dams	1,550
Omission of all water supplied by Cussewago Creek	1,220
Omission of Reservoir A	2,750
Increasing supply for Meadville and other communities below 50 cubic feet per second	1,160
Total	7,430

If all of these unfavorable modifications are included, the diminished supply to the canal during the 352 days of draft from storage in 1909-10 would have been 21.1 million cubic feet per day, amounting in a season of 229 days to 4830 million cubic feet.

CONCLUSIONS

The feature which stands out most prominently as the result of the investigations is that if the two projects under consideration are to be carried out there should be cooperation by those in charge. It is very desirable, if not essential, that the supply of water for the Lake Erie and Ohio River Canal should be chiefly French Creek water stored in an enlarged Pymatuning Reservoir, and if the additional works for the purpose are sufficiently ample the regulation of the Shenango and Beaver Rivers can be more satisfactorily accomplished by the joint works than with independent works. The estimated cost of the joint project would be much less than the total cost of two independent projects.

The 13,930 million cubic feet of water estimated to be required for canal uses during each navigation season, if the canal is given the largest of proposed dimensions and double locks, can be obtained

from French. Mill and Mosquito Creeks if sufficient storage capacity is provided in the Pymatuning Reservoir and elsewhere.

Works which will provide during the driest periods, and with a large margin for contingencies, the above quantity of water for canal uses and all the water required for maintaining a discharge of 450 cubic feet per second in the Shenango River at Sharon consist of:

Reservoir A, on French Creek, with a capacity of 2130 mil. cu. ft.

Diversion dams across French and Cussewago Creeks, about 2.5 miles above Meadville, with an interconnected reservoir of moderate size above them.

A feeder about 20 miles long from a diversion dam at French or Cussewago Creek to the Pymatuning Reservoir, having a winter capacity of 1000 cubic feet per second, and a summer capacity of 1200 cubic feet per second.

The Pymatuning Reservoir, having an area of 39.35 square miles, with a capacity of 19,440 million cubic feet of which 18,000 million cubic feet will be available.

A feeder about 14 miles long leading from the Pymatuning Reservoir to the head of a reservoir on Mill Creek, having a capacity equal to the canal demand.

A reservoir on Mill Creek, having an available capacity of 460 million cubic feet.

A feeder about 11 miles long leading from this reservoir to the summit level of the canal.

The discharge of French Creek in the driest years is far in excess of the quantity which can be utilized by the plan described, and much more of the water can be made available by providing additional reservoirs upon the main stream and its tributaries.

It is also feasible to provide additional drainage area and storage on Pymatuning Creek, thus furnishing additional available water, and it is probably feasible to build the Pymatuning Reservoir to a higher level, thus utilizing more of the water from French Creek by storing it in this reservoir.

There are so many opportunities for supplementing the supply in the ways indicated as to leave no doubt that canal demands far in excess of those now estimated can be met with a reasonable expenditure of money.

The following tables contain details which served as a basis for many of the statements contained in the report.

Respectfully presented,

(Signed) Frederic P. Stearns,

Consulting Engineer.

TABLE NO. XXXVIII

Combined Discharge of French and Cussewago Creeks at Proposed Diversion Dams Above Meadville, and of French Creek Above the Proposed Reservoir A, 3 Miles South of Kimmeytown.

The computed discharges at the above places from May to November, inclusive, are determined from the recorded daily discharges of French Creek at Carlton, and from December to April, inclusive, from corresponding discharges of the Shenango River at Sharon, on the assumption that the discharges are in direct proportion to the sizes of the respective drainage areas.

Thus, the discharge at the diversion dams above Meadville is $\frac{785}{1000}$ of the discharge at Carlton, and $\frac{785}{611}$ of the discharge at Sharon.

The corresponding fractions for the discharge of French Creek into Reservoir A are $\frac{216}{1000}$ and $\frac{216}{611}$.

All quantities are given to the nearest ten.

The daily discharges have been grouped into periods as far as could be done without affecting the accuracy of the computations. The results of the determinations may be summarized by years, as follows:

(Million Cubic Feet)

Year	Above Reservoir A	Between Reservoir A and Diversion Dams	Total
1909, after April 15	4,210	11,070	15,280
1910	9,600	25,260	34,860
1911	11,720	30,800	42,520
1913	11,180	29,460	40,640
1913	12,100	31,870	43,970
1914	8,890	23,420	32,310
1915	10,660	28,010	38,670
1916	8,870	23,370	32,240

Computed Discharge of French and Cussewago Creeks Above Proposed Dams

Period.	Average Discharge. Shenango River at Sharon. Sec. Ft.	Average Discharge. French Creek at Carlton. Sec. Ft.	Corresponding Discharge of French and Cussewago Creeks at Diversion Dams. Total. Sec. Ft.	Total. Mil. Cu. Ft.	Excluding Discharge into Reservoir A. Sec. Ft.	Excluding Discharge into Reservoir A. Mil. Cu. Ft.
1909.						
April 16-18,		2,140	1,680	440	1,220	320
April 19-29,		1,355	1,060	1,010	770	730
April 30,		10,460	8,140	700	5,900	510
				2,150		1,560
April 16-30,		4,746	3,720	6,100	2,700	4,430
May 1-19,		814	640	670	460	480
May 20-31,						
				6,770		4,910
May,		1,210	950	2,450	690	1,780
June,		361	290	780	210	560
July,		168	140	380	100	270
August,		137	110	290	80	200
September,		207	160	430	120	320
October,		629	500	1,300	360	930
November,			270	720	200	540
December,	211					
April 16-December 31,				15,280		11,070
1910.						
January 1-18,	227		290	460	210	340
January 19-31,	1,733		2,220	2,490	1,610	1,810
				2,950		2,150
January,			920	2,150	760	1,630
February 1-27,	750		6,580	570	1,770	410
February 28,	5,122					
				2,720		2,040
February,			8,010	9,680	5,800	7,000
March 1-14,	6,244		540	790	390	570
March 15-31,	418					
				10,470		7,570
March,			440	580	320	420
April 1-15,	342		990	1,290	720	940
April 16-30,	770					
				1,870		1,360
April,		3,970	3,110	1,610	2,260	1,170
May 1-6,		730	580	1,250	420	910
May 7-31,						
				2,860		2,080
May,		560	440	40	320	30
June 1,		1,511	1,190	1,230	860	890
June 2-13,		314	250	370	180	260
June 14-30,						
				1,640		1,180
June,		154	120	320	90	240
July,		123	100	270	70	190
August,		235	180	470	130	340
September,		260	210	470	150	340
October 1-26,		1,442	1,130	490	820	350
October 27-31,						
				960		690
November 1-10,		2,395	1,880	1,620	1,360	1,170
November 11-16,		5,822	4,570	2,370	3,310	1,720
November 17-24,		2,649	2,080	1,440	1,510	2,040
November 25-30,		5,170	4,060	2,100	2,940	1,520
				7,530		5,450
November,			740	960	540	700
December 1-15,	575		270	280	130	130
December 16-27,	397		4,500	1,560	3,260	1,140
December 28-31,	3,498					
				2,800		1,970
December,						
Year 1910.				34,860		25,200

Computed Discharge of French and Cussewago Creeks above proposed Dams

Period.	Average Discharge		Corresponding Discharge of French and Cussewago Creeks at Diversion Dams.			
	Shenango River at Sharon. Sec. Ft.	French Creek at Carlton. Sec. Ft.	Total		Excluding Discharge into Reservoir A.	
			Sec. Ft.	Mil. Cu. Ft.	Sec. Ft.	Mil. Cu. Ft.
1911.						
January 1-19,	2,889		3,710	6,090	2,690	4,420
January 20-27,	497		640	440	460	320
January 28-31,	3,941		5,070	1,760	3,670	1,270
January,				8,290		6,010
February 1-13,	748		960	1,080	760	790
February 14-20,	2,633		3,380	2,040	2,450	1,480
February 21-28,	998		1,280	880	930	640
February				4,000		2,910
March 1-29,	623		800	2,010	580	1,450
March 30-31,	1,171		1,500	260	1,090	190
March,				2,270		1,640
April 1-15,	1,045		1,340	1,740	970	1,260
April 16-30,	1,069		1,380	1,790	1,000	1,300
April,				3,530		2,560
May 1-6,		1,640	1,280	650	930	480
May 7-31,		402	320	690	230	500
May,				1,340		980
June,		302	240	620	170	440
July,		166	130	350	90	240
August 1-28,		199	150	360	110	270
August 29-31,		4,360	3,420	880	2,480	640
August,				1,240		910
September 1-14,		827	650	790	470	570
September 15-30,		2,555	2,000	2,770	1,450	2,000
September,				3,560		2,570
October 1-17,		2,661	2,090	3,070	1 520	2,230
October 18-31,		2,476	1,940	2,350	1,410	1,700
October,				5,420		3,930
November,		3,450	2,710	7 090	1,960	5,080
December 1-9,	529		680	530	490	380
December 10-12,	1,390		1,790	460	1.360	340
December 13-15,	3,975		5,110	1,330	3,700	960
December 16-17,	3,151		4.080	700	2.940	510
December 18-31,	1.187		1.530	1,850	1,110	1,310
December,				4,870		3,500
Year 1911.				42,520		30,800
1912.						
January 1-3,	1,991		2,570	660	1,800	480
January 4-31,	544		700	1,690	510	1.230
January,				2,350		1,710
February 1-25,	502		650	1,410	470	1,070
February 26-29,	3,161		4.070	1.410	2,950	1,020
February,				2,820		2.040
March 1-14,	770		990	1,190	720	870
March 15-31,	4.362		5,610	8,240	4,070	5,980
March,				9,430		6.850
April 1-15,	3.176		4.090	5,300	2.970	3.850
April 16-19,	2,136		2,750	950	1.990	690
April 20-28,	586		760	590	550	430
April 29-30,	2,556		3,280	560	2,380	410
April,				7,400		5.380
May 1-2,		3,085	2,490	420	1,760	800
May 3-13,		1,229	960	910	700	670
May 14-21,		1,753	1.380	960	1.000	690
May 22-31,		692	540	470	390	340
May,				2,760		2,000
June 1-2,		615	480	80	350	60
June 3-6,		1,285	1,010	350	730	250

Computed Discharge of French and Cussewago Creeks above proposed Dams

Period.	Average Discharge		Corresponding Discharge of French and Cussewago Creeks at Diversion Dams.			
	Shenango River at Sharon. Sec. Ft.	French Creek at Carlton. Sec. Ft.	Total		Excluding Discharge into Reservoir A.	
			Sec. Ft.	Mil. Cu. Ft.	Sec. Ft.	Mil. Cu. Ft.
1912						
June 7-30,		323	250	520	180	370
				950		680
June,		180	140	380	100	270
July,		310	250	410	180	300
August 1-19,		1,787	1,410	1,460	1,020	1,060
				1,870		1,360
August,		2,738	2,150	1,490	1,560	1,080
September 1-8,		532	410	500	300	360
September 9-22,		2,128	1,670	1,160	1,210	840
				3,150		2,280
September,		562	440	710	320	520
October 1-19,		4,159	3,270	3,380	2,370	2,460
				4,090		2,980
October,		2,176	1,710	3,400	1,240	2,460
November 1-23,		790	620	370	450	270
				3,770		2,730
November,	337		430	190	310	130
December 1-5,	1,303		1,420	370	960	250
December 6-8,	542		690	420	500	300
December 9-15,	312		400	520	290	380
December 16-30,	1,499		1,930	170	1,400	120
December 31,				1,670		1,180
December,				40,640		29,460
Year 1912						
1913.						
January 1-6,	1,365		1,750	910	1,270	660
January 7-8,	6,922		8,910	1,540	6,460	1,120
January 9,	10,660		13,710	1,190	9,940	850
January 10-25,	4,904		6,310	8,720	4,570	6,310
January 26-31,	1,242		1,600	830	1,160	600
				13,190		9,540
January,	382		500	1,110	360	800
February 1-26,	1,500		1,930	330	1,400	240
				1,440		1,040
February,	1,384		1,780	2,610	1,290	1,800
March 1-17,	659		840	430	610	320
March 18-23,	4,819		6,200	530	4,490	390
March 24,	19,083		24,540	8,480	17,780	6,140
March 25-28,	4,597		5,910	1,530	4,280	1,110
March 29-31,				13,580		9,850
March,	2,042		2,620	220	1,900	160
April 1,	947		1,220	1,470	880	1,060
April 2-15,	383		500	640	360	470
April 16-30,				2,330		1,690
April,		1,305	1,020	170	740	150
May 1-2,		409	320	720	230	520
May 3-28,		1,123	880	220	640	170
May 29-31,				1,110		820
May,		416	330	860	240	620
June,		381	300	130	220	100
July 1-5,		1,620	1,270	320	920	240
July 6-8,		669	520	270	380	200
July 9-14,		1,260	990	80	720	60
July 15,		252	190	260	140	190
July 16-31,				1,070		790
July,		107	80	220	60	160
August,		103	80	210	60	160
September.		269	210	400	150	280
October 1-22,		2,772	2,180	1,700	1,580	1,230
October 23-31,				2,100		1,540
October,		1,043	820	640	590	460
November 1-9,		3,703	2,910	1,000	2,110	1,960
November 10-13,		9,978	7,830	2,710	5,680	1,960
November 14-17,						

Computed Discharge of French and Cussewago Creeks above proposed Dams

Period.	Average Discharge Shenango River at Sharon. Sec. Ft.	Average Discharge French Creek at Carlton. Sec. Ft.	Corresponding Discharge of French and Cussewago Creeks at Diversion Dams. Total Sec. Ft.	Total Mil. Cu. Ft.	Excluding Discharge into Reservoir A. Sec. Ft.	Excluding Discharge into Reservoir A. Mil. Cu. Ft.
1913						
November 18-30,		2,040	1,690	1,800	1,160	1,300
November,				6,150		4,450
December 1-15,	430		550	710	400	520
December 16-31,	553		720	1,000	520	720
December,				1,710		1,240
Year 1913				43,970		31,870
1914.						
January 1-20,	819		1,050	1,810	760	1,310
January 21-31,	2,517		3,230	3,070	2,340	2,220
January,				4,880		3,530
February 1-7,	1,873		2,400	1,460	1,740	1,060
February 8-28,	288		370	670	270	490
February,				2,130		1,550
March 1-14,	292		370	460	270	340
March 15-31,	2,691		3,460	5,080	2,510	3,690
March,				5,540		4,030
April 1-15,	2,541		3,270	4,230	2,370	3,080
April 16-30,	1,763		2,260	2,930	1,640	2,120
April,				7,160		5,200
May 1-5,		1,446	1,130	490	820	350
May 6-12,		4,793	3,770	2,280	2,730	1,650
May 13-15,		10,500	8,250	2,140	5,980	1,550
May 16-31,		1,331	1,050	1,450	760	1,050
May,				6,360		4,600
June,		304	240	630	170	450
July,		157	120	320	90	240
August,		170	140	380	100	270
September,		216	170	440	120	310
October,		247	190	510	140	380
November 1-26,		545	430	980	310	710
November 27-30,		2,163	1,700	580	1,230	420
November,				1,560		1,130
December 1,	623		800	70	580	50
December 2-15,	1,042		1,340	1,620	970	1,170
December 16-31,	397		510	710	370	510
December,				2,400		1,730
Year 1914.				32,310		23,420
1915.						
January 1-6,	477		610	310	440	230
January 7-12,	2,111		2,720	1,410	1,970	1,020
January 13-22,	1,033		1,330	1,150	960	830
January 23-31,	570		730	570	530	410
January,				3,440		2,490
February 1,	3,092		3,970	340	2,880	250
February 2-3,	9,856		12,670	2,190	9,180	1,590
February 4-5,	4,730		6,080	1,050	4,410	760
February 6-20,	2,171		2,790	3,610	2,020	2,620
February 21-28,	782		1,010	700	730	500
February,				7,890		5,720
March,	366		470	1,260	340	910
April 1-15,	258		330	420	240	310
April 16-30,	164		210	270	150	190
April,				690		500
May 1-7,		641	500	300	360	220
May 8-12,		1,880	1,480	630	1,070	460
May 13-21,		682	540	420	390	300
May 22-25,		2,275	1,780	610	1,290	450

Computed Discharge of French and Cussewago Creeks above proposed Dams

Period.	Average Discharge Shenango River at Sharon. Sec. Ft.	Average Discharge French Creek at Carlton. Sec. Ft.	Corresponding Discharge of French and Cussewago Creeks at Diversion Dams. Total Sec. Ft.	Total Mil. Cu. Ft.	Excluding Discharge into Reservoir A. Sec. Ft.	Excluding Discharge into Reservoir A. Mil. Cu. Ft.
1915						
May 26-31,		742	580	300	420	220
May,				2,260		1,650
June,		383	300	780	220	570
July 1-7,		396	320	190	230	140
July 8-23,		2,090	1,640	2,270	1,190	1,640
July 24-31,		708	550	380	400	280
July,				2,840		2,060
August 1-2,		640	500	80	360	60
August 3,		1,180	920	80	670	60
August 4-6,		12,233	9,600	2,490	6,960	1,800
August 7-10,		5,945	4,660	1,610	3,380	1,170
August 11-31,		2,150	1,680	3,040	1,220	2,210
August,				7,300		5,300
September 1-14,		643	500	600	360	440
September 15-26,		1,115	870	900	630	650
September 27-30,		1,793	1,410	490	1,020	350
September,				1,990		1,440
October 1-10,		1,136	900	780	650	560
October 11-23,		2,060	1,620	1,820	1,170	1,310
October 24-31,		718	570	390	410	280
October,				2,990		2,150
November 1-19,		546	430	710	310	510
November 20-30,		4,000	3,140	2,980	2,280	2,170
November,				3,690		2,680
December 1-15,	375		480	630	350	450
December 16-17,	530		680	120	490	80
December 18-20,	2,961		3,810	990	2,760	710
December 21-31,	1,467		1,890	1,800	1,370	1,300
December,				3,540		2,540
Year 1915				38,670		28,010
1916.						
January 1-16,	2,559		3,290	4,540	2,380	3,290
January 17-21,	681		870	380	630	270
January 22-31,	1,334		1,710	1,480	1,240	1,070
January,				6,400		4,630
February 1-3,	1,307		1,680	440	1,220	320
February 4-29,	365		470	1,050	340	760
February,				1,490		1,080
March 1-6,	392		510	270	370	190
March 7-19,	1,714		2,210	2,470	1,600	1,800
March 20-21	722		930	160	670	120
March 22-31,	4,607		5,920	5,120	4,290	3,710
March,				8,020		5,820
April 1-3,	1,706		2,190	570	1,590	410
April 4-13,	741		950	820	690	600
April 14-15,	1,509		1,940	340	1,410	240
April 16-21,	1,367		1,750	910	1,270	660
April 22-24,	3,349		4,300	1,110	3,120	810
April 25-30,	1,522		1,960	1,020	1,420	740
April,				4,770		3,460
May 1-10,		1,740	1,370	1,180	990	860
May 11-22,		720	570	590	410	420
May 23-31,		1,797	1,410	1,100	1,020	800
May,				2,870		2,080
June 1-23,		1,408	1,100	2,180	800	1,590
June 24-30,		678	540	330	390	240
June,				2,510		1,830
July,		355	280	760	200	540
August,		194	150	400	110	290

Computed Discharge of French and Cussewago Creeks above proposed Dams

Period.	Average Discharge Shenango River at Sharon. Sec. Ft.	Average Discharge French Creek at Carlton. Sec. Ft.	Corresponding Discharge of French and Cussewago Creeks at Diversion Dams. Total Sec. Ft.	Total Mil. Cu. Ft.	Excluding Discharge into Reservoir A. Sec. Ft.	Excluding Discharge into Reservoir A. Mil. Cu. Ft.
1916						
September,		219	170	440	120	310
October,		342	260	690	190	510
November 1-23,		530	410	810	300	600
November 24-30,		2,783	2,180	1,320	1,580	960
November,				2,130		1,560
December 1-15,	446		580	760	420	540
December 16-27,	224		290	310	210	220
December 28-31,	1,559		2,000	690	1,450	500
December,				1,760		1,260
Year 1916,				32,240		23,370

TABLE NO. XXXIX

TABLE SHOWING HOW THE FRENCH CREEK WORKS USED AS A BASIS FOR COMPUTATIONS, AS DESCRIBED IN THIS REPORT, COULD HAVE BEEN OPERATED FROM APRIL 16, 1909, TO DEC. 31, 1916, IF THE FLOW THROUGH THE FEEDER WERE NOT RESTRICTED ON ACCOUNT OF THE FILLING OF THE PYMATUNING RESERVOIR

In making this estimate it is assumed that 100 second feet (260 mil. cu. ft. in a 30 day month) of water would be discharged over the diversion dams for the use of Meadville and the communities below from December to April, inclusive, and 150 cubic feet per second (390 mil. cu. ft. in a 30 day month) for the remainder of the year, except at such times as the natural flow is less than these amounts, when the discharge is assumed to be the same as the natural flow.

Two reservoirs are assumed to be in existence: Reservoir A, having a capacity of 2130 mil. cu. ft., and the interconnected reservoir on Cussewago and French Creeks created by the diversion dams, having an available capacity of 400 mil. cu. ft. above the flow line of the feeder and 720 mil. cu. ft. in all; that the feeder leading to Pymatuning Reservoir will be operated at its full capacity whenever the natural flow of the stream or the natural flow supplemented by water drawn from the storage reservoirs will supply the water.

The amount of unavoidable waste at the diversion dams over and above the amount discharged for the use of the communities below these dams is indicated.

The results in the table are given by months, but the original computations were made for shorter periods so as to cover all fluctuations of the reservoirs. The total of the fluctuations which would have occurred during each month is shown in the table.

OPERATION OF FRENCH CREEK WORKS, WITH GREATEST POSSIBLE DISCHARGE INTO PYMATUNING RESERVOIR

(Million Cubic Feet)

Date and Period	Total Discharge at Diversion Dams	Reservoir A.			Cussewago and Bemus Dam Resr.			Discharge through Feeder.	Discharge into Creek at Diversion Dams	
		Added to Storage	Taken from Storage	Available Quantity in Reservoir.	Added to Storage	Taken from Storage	Available Quantity in Reservoir		For Use of Communities	Unavoidable Waste
1909.										
Apr. 16				2,130			720			
Apr. 16-30,	2,150	0	0		230	230		1,560	130	460
May 1				2,130			720			
May	6,770	0	440		0	300		3,220	400	3,890
June 1				1,690			420			
June	2,450	0	1,040		0	0		3,100	390	0
July 1				650			420			
July	780	0	650		0	420		1,450	400	0
Aug. 1				0			0			
Aug.	380	0	0		0	0		0	380	0
Sept. 1				0			0			
Sept.	290	0	0		0	0		0	290	0
Oct. 1				0			0			
Oct.	430	0	0		0	0		30	400	0
Nov. 1				0			0			
Nov.	1,300	0	0		0	0		910	390	0
Dec. 1				0			0			
Dec.	730	0	0		0	0		460	270	0
Totals	15,250	0	2,130		230	950		10,730	3,050	4,350
1910										
Jan. 1				0			0			
Jan.	2,950	690	0		570	0		1,420	270	0
Feb. 1				690			570			
Feb.	2,720	160	180		320	240		2,420	240	0
Mar. 1				670			650			
Mar.	10,470	1,460	530		70	300		2,680	270	6,820
Apr. 1				1,600			420			
Apr.	1,870	0	1,510		0	0		3,120	260	0
May 1				90			420			
May	2,860	440	530		300	720		2,800	400	170
June 1				0			0			
June	1,640	0	0		0	0		1,250	390	0
July 1				0			0			
July	320	0	0		0	0		0	320	0
Aug. 1				0			0			
Aug.	270	0	0		0	0		0	270	0
Sept. 1				0			0			
Sept.	470	0	0		0	0		80	390	0
Oct. 1				0			0			
Oct.	960	0	0		0	0		560	400	0
Nov. 1				0			0			
Nov.	7,530	2,070	0		720	0		3,110	390	1,240
Dec. 1				2,070			720			
Dec.	2,800	430	1,290		300	300		2,940	270	450
Year 1910	34,860	5,250	4,040		2,280	1,560		20,380	3,870	8,680
1911										
Jan. 1				1,210			720			
Jan.	8,290	940	20		300	300		2,690	270	4,420
Feb. 1				2,130			720			
Feb.	4,000	0	0		160	160		2,420	240	1,340
Mar. 1				2,130			720			
Mar.	2,270	70	450		0	300		2,680	270	0

(Million Cubic Feet)

Date and Period	Total Discharge at Diversion Dams	Reservoir A.			Cussewago and Bemus Dam Resr.			Discharge through Feeder	Discharge into Creek at Diversion Dams	
		Added to Storage	Taken from Storage	Available Quantity in Reservoir.	Added to Storage	Taken from Storage	Available Quantity in Reservoir		For Use of Communities	Unavoidable Waste
1911										
Apr. 1				1,750			420			
Apr.	3,550	150	0		0	0		3,120	260	0
May 1				1,900			420			
May	1,340	0	1,550		0	420		2,910	400	0
June 1				350			0			
June	620	0	350		0	0		580	390	0
July 1				0			0			
July	350	0	0		0	0		0	350	0
Aug. 1				0			0			
Aug.	1,240	240	0		290	0		310	400	0
Sept. 1				240			290			
Sept.	3,560	760	240		140	290		2,800	390	0
Oct. 1				760			140			
Oct.	5,420	1,370	0		320	0		3,220	400	110
Nov. 1				2,130			460			
Nov.	7,030	0	0		260	0		3,110	390	3,270
Dec. 1				2,130			720			
Dec.	4,870	180	180		300	300		2,930	270	1,670
Year 1911	42,520	3,710	2,790		1,770	1,770		26,760	4,030	10,810
1912										
Jan. 1				2,130			720			
Jan.	2,350	0	680		0	300		2,680	270	380
Feb. 1				1,450			420			
Feb.	2,820	390	970		300	0		2,510	250	340
Mar. 1				870			720			
Mar.	9,430	1,260	0		130	130		2,680	270	5,220
Apr. 1				2,130			720			
Apr.	7,460	120	120		190	300		3,100	260	4,150
May 1				2,130			610			
May	2,760	20	390		70	680		3,220	400	120
June 1				1,760			0			
June	950	0	1,760		0	0		2,320	300	0
July 1				0			0			
July	380	0	0		0	0		0	380	0
Aug. 1				0			0			
Aug.	1,870	0	0		270	0		1,200	400	0
Sept. 1				0			270			
Sept.	3,150	500	410		420	420		2,670	390	0
Oct. 1				90			270			
Oct.	4,090	930	90		720	270		2,060	400	340
Nov. 1				930			720			
Nov.	3,770	710	140		0	300		3,110	390	0
Dec. 1				1,500			420			
Dec.	1,670	80	1,530		30	0		2,820	270	0
Year 1912	40,640	4,010	6,090		2,130	2,400		28,370	4,070	10,550
1913										
Jan.1				50			450			
Jan.	13,190	2,080	0		270	0		2,680	270	7,890
Feb. 1				2,130			720			
Feb.	1,440	90	1,060		50	300		2,420	240	0
Mar. 1				1,160			470			
Mar.	13,580	970	0		380	130		2,680	270	9,410
Apr. 1				2,130			720			
Apr.	2,330	0	840		0	300		3,100	260	110
May 1				1,290			420			
May	1,110	0	1,290		0	420		2,420	400	0
June 1				0			0			
June	860	0	0		0	0		470	390	0
July 1				0			0			
July	1,070	0	0		0	0		670	400	0
Aug. 1				0			0			
Aug.	220	0	0		0	0		0	220	0
Sept. 1				0			0			
Sept.	210	0	0		0	0		0	210	0
Oct. 1				0			0			

(Million Cubic Feet)

Date and Period	Total Discharge at Diversion Dams	Reservoir A. Added to Storage	Reservoir A. Taken from Storage	Reservoir A. Available Quantity in Reservoir.	Cussewago and Bemus Dam Resr. Added to Storage	Cussewago and Bemus Dam Resr. Taken from Storage	Cussewago and Bemus Dam Resr. Available Quantity in Reservoir	Discharge through Feeder	Discharge into Creek at Diversion Dams: For Use of Communities	Discharge into Creek at Diversion Dams: Unavoidable Waste
1913										
Oct.	2,100	470	0	470	340	0	340	890	400	0
Nov. 1	6,150	1,300	410	1,360	380	0	720	3,110	390	1,380
Dec. 1	1,710	0	1,200		0	300		2,940	270	0
Year 1913	43,970	4,910	4,800		1,420	1,450		21,380	3,720	18,790
1914										
Jan. 1	4,880	850	90	160	300	0	420	2,680	270	870
Feb. 1	2,130	400	1,020	920	0	300	720	2,420	240	390
Mar. 1	5,540	1,400	300	300	720	420	420	2,520	270	1,350
Apr. 1	7,160	730	0	1,400	0	0	720	3,100	260	3,070
May 1	6,360	0	0	2,130	90	510	300	3,220	400	3,160
June 1	630	0	2,130	2,130	0	300	0	2,670	390	0
July 1	320	0	0	0	0	0	0	0	320	0
Aug. 1	380	0	0	0	0	0	0	0	380	0
Sept. 1	440	0	0	0	0	0	0	50	390	0
Oct. 1	510	0	0	0	0	0	0	110	400	0
Nov. 1	1,560	0	0	0	260	0	260	910	390	0
Dec. 1	2,400	0	0	0	410	550	260	2,270	270	0
Year 1914	32,310	3,380	3,540		1,780	2,080		19,950	3,980	8,840
1915.										
Jan. 1	3,440	590	0	0	600	290	120	2,270	270	0
Feb. 1	3,890	1,540	0	590	290	60	430	2,420	240	3,460
Mar. 1	1,260	0	1,450	2,130	0	240	660	2,680	270	0
Apr. 1	690	0	680	680	0	420	420	1,530	260	0
May 1	2,260	350	350	0	200	70	0	1,730	400	0
June 1	780	0	0	0	0	130	130	520	390	0
July 1	2,840	280	280	0	400	130	0	2,170	400	0
Aug. 1	7,300	1,720	0	0	520	70	270	3,100	400	1,630
Sept. 1	1,990	20	1,230	1,720	0	300	720	3,110	390	0
Oct. 1	2,990	300	690	510	0	240	420	3,220	400	0
Nov. 1	3,690	830	120	120	720	180	180	1,700	390	350
Dec. 1	3,540	760	760	830	360	560	720	2,940	270	330
Year 1915	38,670	6,390	5,560		3,090	2,490		27,390	4,080	5,770
1916.										
Jan. 1	6,400	1,300	0	830	100	100	720	2,680	270	2,150
Feb. 1	1,490	0	1,120	2,130	0	300	720	2,510	250	150

(Million Cubic Feet)

Date and Period	Total Discharge at Diversion Dams	Reservoir A.			Cussewago and Bemus Dam Resr.			Discharge through Feeder	Discharge into Creek at Diversion Dams	
		Added to Storage	Taken from Storage	Available Quantity in Reservoir.	Added to Storage	Taken from Storage	Available Quantity in Reservoir		For Use of Communities	Unavoidable Waste
1916										
Mar. 1				1,010			420			
Mar.	8,020	1,460	340		300	0		2,680	270	3,650
Apr. 1				2,130			720			
Apr.	4,770	0	0		300	300		3,120	260	1,390
May 1				2,130			720			
May	2,870	40	510		0	300		3,220	400	20
June 1				1,660			420			
June	2,510	0	570		0	420		3,110	390	0
July 1				1,090			0			
July	760	0	1,090		0	0		1,450	400	0
Aug. 1				0			0			
Aug.	400	0	0		0	0		0	400	0
Sept. 1				0			0			
Sept.	440	0	0		0	0		50	390	0
Oct. 1				0			0			
Oct.	690	0	0		0	0		290	400	0
Nov. 1				0			0			
Nov.	2,130	360	0		320	0		1,060	390	0
Dec. 1				360			320			
Dec.	1,760	0	360		400	320		1,770	270	0
Dec. 31				0			400			
Year 1916	32,240	3,160	3,990		1,420	1,740		21,940	4,090	7,360

TABLE NO. XL

Table showing how the canal could have been supplied with water and the Shenango and Beaver Rivers regulated, from April, 1909, to December 31, 1916, inclusive, by the system of works described in this report and used as a basis for computations, assuming that the requirements of the canal are 704 cubic feet per second for a navigation season of 229 days, making the total requirement 13,930 million cubic feet, and that the regulation provides for a minimum flow of 450 cubic feet per second in the Shenango River at Sharon.

The quantity of storage in the different reservoirs is the total and not the available quantity. In order to obtain the available quantity, deductions should be made, as follows:

	Mil. Cu. Ft.
Pymatuning Reservoir,	1440
Cussewago and Bemus Dam Resr.,	630
Mill Creek Reservoir,	10
Total,	2080

(Million

Date and Period.	Discharge of French and Cussewago Creeks.	Reservoir A, French Creek.			Cussewago & Bemus Dam Reservoir.			Discharge through French Creek Feeder into Pymatuning Reservoir.	Discharge at Diversion Dams		Pymatuning Reservoir.				
		Added to Storage.	Taken from Storage.	Remaining in Reservoir.	Added to Storage.	Taken from Storage.	Remaining in Reservoir.		For use of Communities Below.	Wasted.	Area of Water Surface Sq. Miles.	Precipitation on Water Surface.		Evaporation from Water Surface.	
												Inches.	Mil. Cu. Ft.	Inches.	Mil. Cu. Ft.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1909															
Apr. 16				2,130			1,350				39.35				
Apr. 16-30	2,150	0	0		0	0		0	130	2,020		3.00	273	1.30	119
May 1				2,130			1,350				39.35				
May 1-31	6,770	0	0		0	0		0	400	6,370		3.03	276	3.50	319
Jun 1				2,130			1,350				39.35				
June 1-30	2,450	0	0		0	0		830	390	1,230		4.63	423	4.35	397
July 1,				2,130			1,350				39.35				
July 1-31,	780	0	1,690		0	720		2,790	400	0		2.66	243	4.70	430
Aug. 1,				440			630				39.35				
Aug. 1-31,	380	0	440		0	0		440	380	0		2.30	203	4.30	380
Sept. 1,				0			630				36.5				
Sept. 1-30,	290	0	0		0	0		0	290	0		1.38	111	3.25	261
Oct. 1,				0			630				32.8				
Oct. 1-31,	430	0	0		0	0		30	400	0		1.44	103	2.50	179
Nov. 1,				0			630				28.8				
Nov. 1-30,	1,300	0	0		0	0		910	390	0		2.20	140	1.80	115
Dec. 1,				0			630				25.9				
Dec. 1-31,	730	0	0		0	0		460	270	0		2.34	141	1.20	72
1910.															
Jan. 1,				0			630				26.0				
Jan. 1-31,	2,950	690	0		570	0		1,420	270	0		5.70	361	0.75	47
Feb. 1,				690			1,200				28.7				
Feb. 1-28,	2,720	160	270		300	150		2,420	240	0		4.21	298	0.85	67
Mar. 1,				580			1,350				32.7				
Mar. 1-31,	10,470	1,530	520		0	300		2,680	270	6,820		0.38	31	1.35	110
Apr. 1,				1,610			1,050				37.5				
Apr. 1-15,	580	0	1,110		0	0		1,560	130	0		1.03	92	1.05	93
Apr. 16,				500			1,050				39.0				
Apr. 16-30,	1,290	620	410		0	0		940	130	0		2.28	207	1.30	118
May 1,				710			1,050				39.35				
May 1-31,	2,860	510	0		300	120		1,600	400	170		3.46	316	3.50	320
June 1,				1,220			1,230				39.35				
June 1-30,	1,640	0	510		0	600		2,360	390	0		1.89	173	1.35	398
July 1,				710			630				39.35				
July 1-31,	320	0	710		0	0		710	320	0		3.09	272	4.70	414
Aug. 1,				0			630				36.4				
Aug. 1-31,	270	0	0		0	0		0	270	0		1.50	120	4.30	344
Sept. 1,				0			630				32.5				
Sept. 1-30,	470	0	0		0	0		80	390	0		5.02	360	3.25	233
Oct. 1,				0			630				29.2				
Oct. 1-31,	960	0	0		0	0		560	400	0		4.00	258	2.50	161
Nov. 1,				0			630				26.4				
Nov. 1-30,	7,530	2,070	0		720	0		3,110	390	1,240		3.23	209	1.80	117
Dec. 1,				2,079			1,350				29.4				
Dec. 1-31,	2,800	430	1,290		300	300		2,940	270	450		3.37	247	1.20	88
1911.															
Jan. 1,				1,210			1,350				33.7				
Jan. 1-31,	8,290	940	20		300	300		2,680	270	4,420		3.64	304	0.75	63
Feb. 1,				2,130			1,350				38.5				
Feb. 1-28,	4,000	0	0		0	0		70	240	3,690		2.74	248	0.85	77
Mar. 1,				2,130			1,350				39.35				
Mar. 1-31,	2,270	0	0		0	0		0	270	2,000		2.76	252	1.35	124
Apr. 1,				2,130			1,350				39.35				
Apr. 1-15,	1,740	0	0		0	0		0	130	1,560		2.02	184	1.05	96
Apr. 16,				2,130			1,350				39.35				
Apr. 16-30,	1,790	0	0		0	0		240	130	1,280		1.97	180	1.30	118
May 1,				2,130			1,350				39.35				
May 1-31,	1,340	0	960		0	720		2,320	400	0		1.89	173	3.50	320
June 1,				1,170			630				39.35				
June 1-30,	620	0	1,170		0	0		1,400	390	0		4.36	392	4.35	391
July 1,				0			630				38.1				
July 1-31,	350	0	0		0	0		0	350	0		1.80	152	4.70	397
Aug. 1,				0			630				34.6				

Cubic Feet)

Pymatuning Drainage Area.			Supplied for Canal Uses from Mill and Mosquito Creeks.	Draft from Pymatuning Res'r		Pymatuning Reservoir.				Quantity Wasted Over Pymatuning Dam.	Total Quantity in All Reservoirs.*
Area of Land Surface. Sq. Miles.	Discharge from land Surface. Inches.	Discharge from land Surface. Mil. Cu. Ft.		For Canal Uses.	To Maintain Flow of 450 c. f. s. at Sharon.	Added to Storage.	Taken from Storage.	Remaining in Res'r.	Elev. Water Surface. Feet.		
17	18	19	20	21	22	23	24	25	26	27	28
								19,440	1,020.0		23,390
118.35	1.70	468	560	350	0	0	0			270	
								19,440	1,020.0		23,390
118.35	3.30	907	1,090	800	0	0	0			60	
								19,440	1,020.0		23,390
118.35	1.60	440	530	1,300	0	0	0			0	
								19,440	1,020.0		23,390
118.35	0.30	82	100	1,790	890	0	0			0	
								19,440	1,020.0		20,980
118.35	0.09	25	30	1,850	1,110	0	2,670			0	
								16,770	1,017.5		17,870
121.2	0.06	17	20	1,810	1,100	0	3,040			0	
								13,730	1,014.3		14,830
124.9	0.07	21	20	1,860	1,140	0	3,020			0	
								10,710	1,010.8		11,810
128.9	0.12	36	40	1,780	1,030	0	1,840			0	
								8,870	1,008.4		9,970
131.8	0.40	122	0	0	720	0	70			0	
								8,800	1,008.3		9,900
131.7	1.80	545	0	0	470	1,810	0			0	
								10,610	1,010.7		12,970
129.0	1.70	501	0	0	110	3,040	0			0	
								13,650	1,014.1		16,050
125.0	6.20	1,766	0	0	210	4,160	0			0	
								17,710	1,018.4		20,840
120.2	0.34	94	0	0	290	1,360	0			0	
								19,070	1,019.7		21,090
118.7	0.76	209	220	690	180	370	0			0	
								19,440	1,020.0		21,670
118.35	1.20	330	370	1,510	420	0	0			0	
								19,440	1,020.0		22,360
118.35	0.70	192	170	1,660	670	0	0			0	
								19,440	1,020.0		21,250
118.35	0.11	31	40	1,850	1,090	0	2,340			0	
								16,670	1,017.4		17,770
121.3	0.06	17	20	1,870	1,150	0	3,230			0	
								13,440	1,014.0		14,540
125.2	0.16	47	50	1,770	1,000	0	2,520			0	
								10,920	1,011.1		12,020
128.5	0.36	109	120	1,770	830	0	1,830			0	
								9,090	1,008.7		10,190
131.3	1.37	413	450	1,380	200	2,030	0			0	
								11,120	1,011.3		15,010
128.3	1.69	495	0	0	290	3,310	0			0	
								14,430	1,015.1		17,460
124.0	4.70	1,330	0	0	90	4,160	0			0	
								18,590	1,019.2		22,540
119.2	2.30	635	0	0	30	850	0			0	
								19,440	1,020.0		23,390
118.35	1.30	358	0	0	130	0	0			360	
								19,440	1,020.0		23,390
118.35	1.06	291	0	0	0	0	0			380	
								19,440	1,020.0		23,390
118.35	1.04	286	320	590	0	0	0			0	
								19,440	1,020.0		23,390
118.35	0.61	168	210	1,680	660	0	0			0	
								19,440	1,020.0		21,710
118.35	0.30	83	80	1,740	950	0	1,200			0	
								18,240	1,018.9		19,340
119.6	0.12	34	40	1,850	1,090	0	3,160			0	
								15,080	1,015.8		16,180
123. 1											

(Million

Date and Period.	Discharge of French and Cussewago Creeks.	Reservoir A, French Creek.			Cussewago & Bemus Dam Reservoir.			Discharge through French Creek Feeder into Pymatuning Reservoir.	Discharge at Diversion Dams		Pymatuning Reservoir.				
		Added to Storage.	Taken from Storage.	Remaining in Reservoir.	Added to Storage.	Taken from Storage.	Remaining in Reservoir.		For use of Communities Below.	Wasted.	Area of Water Surface, Sq. Miles.	Precipitation or Water Surface.		Evaporation from Water Surface.	
												Inches.	Mil. Cu. Ft.	Inches.	Mil. Cu. Ft.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Aug. 1-31,	1,240	240	0		290	0		316	400	0		6.12	473	4.30	332
Sept. 1,				240			920				31.9				
Sept. 1-30,	3,560	760	240		140	290		2,800	390	0		6.46	497	3.25	250
Oct. 1,				760			770				34.3				
Oct. 1-31,	5,420	1,370	0		320	0		3,220	400	110		5.68	477	2.50	210
Nov. 1,				2,130			1,090				37.9				
Nov. 1-30,	7,030	0	0		260	0		1,950	390	4,430		3.13	281	1.80	162
Dec. 1,				2,130			1,350				39.35				
Dec. 1-31,	4,870	0	0		0	0		0	270	4,600		4.19	383	1.20	110
1912.															
Jan. 1,				2,130			1,350				39.35				
Jan. 1-31,	2,350	0	0		0	0		0	270	2,080		3.65	334	0.75	69
Feb. 1,				2,130			1,350				39.35				
Feb. 1-29,	2,820	0	0		0	0		0	250	2,270		1.83	167	0.85	78
Mar. 1,				2,130			1,350				39.35				
Mar. 1-31,	9,430	0	0		0	0		0	270	7,770		3.39	310	1.35	123
Apr. 1,				2,130			1,350				39.35				
Apr. 1-15,	5,300	0	0		0	0		0	130	5,170		3.43	313	1.05	96
Apr. 16,				2,130			1,350				39.35				
Apr. 16-30,	2,100	0	0		0	0		160	130	1,810		1.89	173	1.30	119
May 1,				2,130			1,350				39.35				
May 1-31,	2,760	0	0		0	0		1,660	400	630		3.55	324	3.50	320
June 1,				2,130			1,350				39.35				
June 1-30,	950	0	1,700		0	300		2,560	390	0		2.83	259	4.35	398
July 1,				430			1,050				39.35				
July 1-31,	380	0	430		0	420		850	380	0		3.33	297	4.70	419
Aug. 1,				0			630				37.4				
Aug. 1-31,	1,870	0	0		270	0		1,200	400	0		4.80	433	4.30	388
Sept. 1,				0			900				36.3				
Sept. 1-30,	3,150	500	410		420	420		2,670	390	0		3.02	257	3.25	277
Oct. 1,				90			900				37.0				
Oct. 1-31,	4,090	930	90		450	0		2,060	400	340		4.91	430	2.50	219
Nov. 1,				930			1,350				38.3				
Nov. 1-30,	3,770	710	100		0	0		2,650	390	0		1.60	144	1.80	162
Dec. 1,				1,540			1,350				39.35				
Dec. 1-31,	1,670	470	0		0	0		0	270	2,350		3.26	298	1.20	110
1913.															
Jan. 1,				2,010			1,350				39.35				
Jan. 1-31,	13,190	120	0		0	0		0	270	10,450		6.99	639	0.75	69
Feb. 1,				2,130			1,350				39.35				
Feb. 1-28,	1,440	970	970		250	250		80	240	1,120		2.15	197	0.85	78
Mar. 1,				2,130			1,350				39.35				
Mar. 1-31,	13,580	0	0		0	0		0	270	12,090		8.93	816	1.35	123
Apr. 1,				2,130			1,350				39.35				
Apr. 1-15,	1,690	0	0		100	100		0	130	1,560		1.86	170	1.05	96
Apr. 16,				2,130			1,350				39.35				
Apr. 16-30,	640	550	840		0	200		1,000	130	0		0.70	64	1.30	119
May 1,				1,840			1,150				39.35				
May 1-31,	1,110	0	0		0	490		2,490	400	0		2.39	218	3.50	320
June 1,				1,840			660				39.35				
June 1-30,	860	0	1,840		0	30		2,340	390	0		4.51	410	4.35	395
July 1,				0			630				39.2				
July 1-31,	1,070	0	0		0	0		670	400	0		4.98	443	4.70	418
Aug. 1,				0			630				37.5				
Aug. 1-31,	220	0	0		0	0		0	220	0		1.55	128	4.30	356
Sept. 1,				0			630				33.9				
Sept. 1-30,	210	0	0		0	0		0	210	0		1.73	129	3.25	242
Oct. 1,				0			630				30.1				
Oct. 1-31,	2,100	470	0		340	0		890	400	0		4.88	328	2.50	168
Nov. 1,				470			970				27.8				
Nov. 1-30,	6,150	1,300	410		380	0		3,110	390	1,380		3.34	227	1.80	122
Dec. 1,				1,360			1,350				30.8				
Dec. 1-31,	1,710	0	1,200		0	300		2,940	270	0		1.80	136	1.20	91

Cubic Feet)

Pymatuning Drainage Area.			Supplied for Canal Uses from Mill and Mosquito Creeks.	Draft from Pymatuning Res'r.		Pymatuning Reservoir.				Quantity Wasted Over Pymatuning Dam.	Total Quantity in All Reservoirs.*
Area of Land Surf Sq. Miles.	Discharge from land Surface. Inches.	Mil. Cu. Ft.		For Canal Uses.	To Maintain Flow of 450 c. f. s. at Sharon.	Added to Storage.	Taken from Storage.	Remaining in Res'r.	Elev. Water Surface. Feet.		
17	18	19	20	21	22	23	24	25	26	27	28
	0.39	113	130	1,760	980	0	2,180	12,900	1,013.4	0	14,530
125.8	2.60	752	460	1,360	440	2,000	0	14,900	1,015.6	0	16,900
123.4	3.00	847	820	1,070	100	3,180	0	18,080	1,018.7	0	21,770
119.8	1.92	531	620	1,200	40	1,360	0	19,440	1,020.0	0	23,390
118.35	2.67	734	0	0	60	0	0			980	
								19,440	1,020.0		23,390
118.35	1.20	355	0	0	200	0	0	19,440	1,020.0	420	23,390
118.35	1.53	421	0	0	250	0	0	19,440	1,020.0	260	23,390
118.35	5.17	1,420	0	0	30	0	0	19,440	1,020.0	1,580	23,390
118.35	2.61	718	0	0	0	0	0	19,440	1,020.0	930	23,390
118.35	1.44	396	360	550	50	0	0	19,440	1,020.0	0	23,390
118.35	1.01	278	330	1,550	400	0	0	19,440	1,020.0	0	23,390
118.35	0.34	94	110	1,710	800	0	0	19,440	1,020.0	0	23,390
118.35	0.32	89	110	1,780	830	0	1,840	17,600	1,018.3	0	18,700
120.3	0.60	178	200	1,690	770	0	1,040	16,560	1,017.3	0	17,930
121.4	0.72	202	240	1,590	590	670	0	17,230	1,017.9	0	18,690
120.7	2.36	658	580	1,300	430	1,200	0	18,420	1,019.0	0	21,180
119.4	0.87	240	290	1,540	320	1,010	0	19,440	1,020.0	0	22,800
118.35	0.95	261	0	0	440	0	0			10	
								19,440	1,020.0		23,270
118.35	7.22	1,980	0	0	0	0	0	19,440	1,020.0	2,550	23,390
118.35	0.79	217	0	0	410	0	0	19,440	1,020.0	0	23,390
118.35	7.45	2,050	0	0	20	0	0	19,440	1,020.0	2,720	23,390
118.35	0.93	255	0	0	10	0	0	19,440	1,020.0	320	23,390
118.35	0.35	96	120	790	260	0	0	19,440	1,020.0	0	22,900
118.35	0.44	121	140	1,740	770	0	0	19,440	1,020.0	0	22,410
118.35	0.31	85	100	1,730	860	0	150	19,290	1,019.8	0	20,390
118.5	0.55	152	180	1,700	670	0	1,530	17,760	1,018.4	0	18,880
120.2	0.08	23	20	1,860	1,130	0	3,190	14,570	1,015.2	0	15,670
123.8	0.06	18	20	1,810	1,110	0	3,010	11,560	1,011.9	0	12,660
127.6	0.26	78	90	1,800	950	0	1,630	9,930	1,009.8	0	11,840
129.9	2.04	610	580	1,250	380	2,200	0	12,130	1,012.5	0	15,310
126.9	0.90	260	0	0	570	2,880	0			0	

(Million

Date and Period.	Discharge of French and Cussewago Creeks.	Reservoir A, French Creek.			Cussewago & Bemus Dam Reservoir.			Discharge through French Creek Feeder into Pymatuning Reservoir.	Discharge at Diversion Dams		Pymatuning Reservoir.				
		Added to Storage.	Taken from Storage.	Remaining in Reservoir.	Added to Storage.	Taken from Storage.	Remaining in Reservoir.		For Use of Communities below.	Wasted.	Area of Water Surface. Sq. Miles.	Precipitation on Water Surface. Inches.	Precipitation on Water Surface. Mil. Cu. Ft	Evaporation from Water Surface. Inches.	Evaporation from Water Surface. Mil. Cu. Ft
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1914.															
Jan. 1,				160			1,050				34.4				
Jan. 1-31,	4,880	850	90		300	0		2,680	270	870		3.49	295	0.75	63
Feb. 1,				920			1,350				38.5				
Feb. 1-28,	2,130	580	0		0	0		870	240	440		1.98	179	0.85	77
Mar. 1,				1,500			1,350				39.35				
Mar. 1-31,	5,540	930	300		0	0		0	270	3,870		3.10	283	1.35	123
Apr. 1,				2,130			1,350				39.35				
Apr. 1-15,	4,230	0	0		0	0		0	130	3,820		2.96	270	1.05	96
Apr. 16,				2,130			1,350				39.35				
Apr. 16-30,	2,930	0	0		0	0		0	130	2,350		2.05	187	1.30	119
May 1,				2,130			1,350				39.35				
May 1-31,	6,360	0	0		90	90		590	400	5,370		4.70	429	3.50	319
June 1,				2,130			1,350				39.35				
June 1-30,	630	0	2,130		0	350		2,720	390	0		3.38	310	4.35	397
July 1,				0			1,000				39.35				
July 1-31,	320	0	0		0	370		370	320	0		3.24	286	4.70	414
Aug. 1,				0			630				36.6				
Aug. 1-31,	380	0	0		0	0		0	380	0		4.68	379	4.30	348
Sept. 1,				0			630				33.3				
Sept. 1-30	440	0	0		0	0		50	390	0		1.43	104	3.25	237
Oct. 1,				0			630				29.5				
Oct. 1-31,	510	0	0		0	0		110	400	0		3.33	212	2.50	160
Nov. 1,				0			630				25.4				
Nov. 1-30,	1,560	0	0		260	0		910	390	0		2.23	124	1.80	100
Dec. 1,				0			890				22.6				
Dec. 1-31,	2,400	0	0		410	550		2,270	270	0		4.00	232	1.20	70
1915.															
Jan. 1,				0			750				27.3				
Jan. 1-31,	3,440	590	0		600	290		2,270	270	0		3.17	216	0.75	51
Feb. 1,				590			1,060				31.4				
Feb. 1-28,	7,890	1,540	0		290	60		2,420	240	3,460		3.03	238	0.85	67
Mar. 1,				2,130			1,290				36.1				
Mar. 1-31,	1,260	0	1,450		0	240		2,680	270	0		1.15	100	1.35	117
Apr. 1,				680			1,050				38.7				
Apr. 1-15,	420	0	680		0	60		1,010	130	0		0.60	54	1.05	95
Apr. 16,				0			990				39.35				
Apr. 16-30,	270	0	0		20	360		500	130	0		0.38	34	1.20	118
May 1,				0			650				38.5				
May 1-31,	2,260	350	350		200	70		1,730	400	0		3.76	334	3.50	311
June 1,				0			780				38.0				
June 1-30,	780	0	0		0	130		520	390	0		2.90	253	4.35	372
July 1,				0			650				35.6				
July 1-31,	2,840	280	280		400	130		2,170	400	0		6.32	530	4.70	394
Aug. 1,				0			920				36.6				
Aug. 1-31,	7,300	1,510	0		500	70		3,100	400	1,630		5.65	494	4.20	376
Sept. 1,				1,510			1,350				38.7				
Sept. 1-30,	1,990	20	1,230		0	300		3,110	390	0		2.85	258	3.25	294
Oct. 1,				300			1,050				39.3				
Oct. 1-31,	2,990	660	300		240	240		2,320	400	0		2.71	248	2.50	229
Nov. 1,				660			1,050				39.35				
Nov. 1-30,	3,690	830	0		590	290		1,990	390	350		2.82	258	1.80	165
Dec. 1,				1,490			1,350				39.35				
Dec. 1-31,	3,540	640	0		360	360		0	270	2,630		4.08	373	1.20	110
1916.															
Jan. 1,				2,130			1,350				39.35				
Jan. 1-31,	6,400	0	0		0	0		0	270	4,830		2.89	264	0.75	69
Feb. 1,				2,130			1,350				39.35				
Feb. 1-29,	1,490	0	0		0	0		0	250	1,240		2.21	202	0.85	78
Mar. 1,				2,130			1,350				39.35				
Mar. 1-31,	8,020	0	0		0	0		0	270	6,330		3.72	340	1.25	123
Apr. 1,				2,130			1,350				39.35				
Apr. 1-15,	1,730	0	0		0	0		0	130	1,600		1.29	118	1.05	96
Apr. 16,				2,130			1,350				39.35				
Apr. 16-30,	3,040	0	0		0	0		0	130	2,720		2.26	207	1.20	119

Cubic Feet)

Pymatuning Drainage Area.			Supplied for Canal Uses from Mill and Mosquito Creeks.	Draft from Pymatuning Res'r		Pymatuning Reservoir.				Quantity Wasted Over Pymatuning Dam.	Total Quantity in All Reservoirs.*
Area of Land Surface. Sq. Miles.	Discharge from land Surface. Inches.	Mil. Cu. Ft.		For Canal Uses.	To Maintain Flow of 450 c. f. s. at Sharon.	Added to Storage.	Taken from Storage.	Remaining in Res'r.	Elev. Water Surface. Feet.		
17	18	19	20	21	22	23	24	25	26	27	28
								15,010	1,015.7		16,690
123.3	2.68	756	0	0	70	3,600	0	18,610	1,019.2	0	21,350
119.2	1.17	322	0	0	460	830	0	19,440	1,020.0	0	22,760
118.35	3.04	837	0	0	300	0	0	19,440	1,020.0	700	23,390
118.35	2.32	638	0	0	0	0	0	19,440	1,020.0	810	23,390
118.35	1.61	442	480	430	20	0	0	19,440	1,020.0	60	23,390
118.35	2.93	806	660	1,220	290	0	0	19,440	1,020.0	0	23,390
118.35	0.22	60	80	1,750	940	0	0	19,440	1,020.0	0	20,910
118.35	0.24	67	80	1,810	970	0	2.470	16,970	1,017.6	0	18,070
121.1	0.14	40	40	1,840	1,060	0	2,830	14,140	1,014.7	0	15,240
124.4	0.09	26	30	1,800	1,080	0	2,940	11,200	1,011.4	0	12,360
128.2	0.12	36	40	1,850	1,090	0	2,740	8,460	1,007.8	0	9,560
132.3	0.23	71	80	1,740	930	0	1,670	6,790	1,005.3	0	8,150
135.1	1.28	395	0	0	0	2,830	0			0	
								9,620	1,009.4		10,840
130.4	1.89	560	0	0	0	2,990	0	12,610	1,013.1	0	14,730
126.3	4.32	1,240	0	0	0	3,830	0	16,440	1,017.1	0	20,330
121.6	0.69	193	0	0	490	2,370	0	18,810	1,019.4	0	21,010
119.0	0.24	66	0	0	400	630	0	19,440	1,020.0	0	20,900
118.35	0.15	41	50	860	410	0	810	18,630	1,019.2	0	19,750
119.2	0.53	147	170	1,710	690	0	500	18,130	1,018.8	0	19,380
119.7	0.31	87	100	1,720	880	0	2,120	16,010	1,016.7	0	17,130
122.1	1.01	285	330	1,550	150	890	0	16,900	1,017.6	0	18,290
121.1	1.08	302	360	1,530	90	1,900	0	18,800	1,019.4	0	22,130
119.0	0.31	85	110	1,720	870	570	0	19,370	1,019.8	0	21,190
118.4	0.50	138	170	1,720	690	70	0	19,440	1,020.0	0	21,620
118.35	0.55	151	180	1,640	590	0	0	19,440	1,020.0	0	22,750
118.35	1.93	530	0	0	0	0	0			790	
								19,440	1,020.0		23,390
118.35	3.51	964	0	0	0	0	0	19,440	1,020.0	1,160	23,390
118.35	0.82	226	0	0	270	0	0	19,440	1,020.0	80	23,390
118.35	4.39	1,210	0	0	80	0	0	19,440	1,020.0	1,350	23,390
118.35	0.94	258	0	0	20	0	0	19,440	1,020.0	260	23,390
118.35	1.67	459	530	380	0	0	0			170	

(Million

Date and Period.	Discharge of French and Cussewago Creeks.	Reservoir A, French Creek.			Cussewago & Bemus Dam Reservoir.			Discharge through French Creek Feeder into Pymatuning Reservoir.	Discharge at Diversion Dams		Pymatuning Reservoir.				
		Added to Storage.	Taken from Storage.	Remaining in Reservoir.	Added to Storage.	Taken from Storage.	Remaining in Reservoir.		For use of Communities Below.	Wasted.	Area of Water Surface. Sq. Miles.	Precipitation on Water Surface.		Evaporation from Water Surface.	
												Inches.	Mil. Cu. Ft.	Inches.	Mil. Cu. Ft.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
May 1,				2,130			1,350				39.35				
May 1-31,	2,870	0	0		0	0		1,840	400	630		3.51	321	3.50	320
June 1,				2,130			1,350				39.35				
June 1-30,	2,510	0	0		0	0		1,760	390	360		3.75	343	4.35	398
July 1,				2,130			1,350				39.35				
July 1-31,	760	0	1,380		0	300		3,130	400	0		1.54	141	4.70	430
Aug. 1,				750			1,050				39.35				
Aug. 1-31,	400	0	750		0	420		1,170	400	0		2.08	185	4.30	383
Sept. 1,				0			630				37.2				
Sept. 1-30,	440	0	0		0	0		50	390	0		3.86	320	3.25	270
Oct. 1,				0			630				34.1				
Oct. 1-31,	690	0	0		0	0		290	400	0		2.87	216	2.50	189
Nov. 1,				0			630				30.8				
Nov. 1-30,	2,130	360	0		320	0		1,060	390	0		2.91	202	1.80	125
Dec. 1,				360			950				28.9				
Dec. 1-31,	1,760	0	360		400	320		1,770	270	0		3.97	279	1.20	84
				0			1,030				31.4				

Cubic Feet)

Pymatuning Drainage Area.				Draft from Pymatuning Res'r		Pymatuning Reservoir.					
Area of Land Surface. Sq. Miles.	Discharge from land Surface. Inches.	Discharge from land Surface. Mil. Cu. Ft.	Supplied for Canal Uses from Mill and Mosquito Creeks.	For Canal Uses.	To Maintain Flow of 450 c. f. s. at Sharon.	Added to Storage.	Taken from Storage.	Remaining in Res'r.	Elev. Water Surface. Feet.	Quantity Wasted Over Pymatuning Dam.	Total Quantity in All Reservoirs.*
17	18	19	20	21	22	23	24	25	26	27	28
118.35								19,440	1,020.0		23,390
	0.77	212	250	1,630	420	0	0			0	
118.35								19,440	1,020.0		23,390
	0.82	225	270	1,560	370	0	0			0	
118.35								19,440	1,020.0		23,390
	0.15	41	50	1,840	1,050	0	0			0	
118.35								19,440	1,020.0		21,710
	0.07	19	20	1,860	1,130	0	1,990			0	
120.5								17,450	1,018.1		18,550
	0.08	23	30	1,800	1,090	0	2,770			0	
123.6								14,680	1,015.4		15,780
	0.13	38	40	1,850	1,070	0	2,560			0	
126.9								12,120	1,012.5		13,220
	0.29	86	100	1,730	860	0	1,370			0	
128.8								10,750	1,010.9		12,530
	0.95	281	0	0	460	1,790	0			0	
126.3								12,540	1,013.0		14,040

*Mill Creeek Res'r. with capacity of 470 mil. cu. ft. assumed to be full at all times.

TABLE NO. XLI.

Quantity of Water to be Supplied from Storage Annually in Order to Maintain a Minimum Discharge of 450 c. f. s. in the Shenango River at Sharon.

Year.	Million Cubic Feet
1909	5990
1910	6910
1911	4570
1912	5160
1913	6940
1914	7210
1915	5260
1916	6820

This table differs from one contained in the body of the report by covering the whole calendar year, while that in the report relates to the navigation season only.

TABLE NO. XLII.

Relation between Quantity of Water that Would Have Been Discharged into Pymatuning Reservoir, in Accordance with the Plan Used as a Basis for Computation, and the Amount that it would have been Possible to Discharge through the Feeder if the Flow Where Not Restricted.

(Million Cubic Feet)

1 Year. (Dec.-Nov.)	2 Unrestricted Discharge Through Feeder.	3 Restricted Discharge Through Feeder.	4 Wasted at Diversion Dams.	5 Stored in French Creek Reservoirs.
1909, after Apr. 15	8,710	5,000	3,710	0
1909-10	17,900	17,900	0	0
1910-11	26,770	17,930	8,350	490
1911-12	28,480	13,810	12,450	2,220
1912-13	21,260	10,580	10,160	520
1913-14	20,620	11,240	7,880	1,500
1914-15	26,720	26,090	0	630
1915-16	23,110	9,300	12,700	1,110

Column No. 2 of the table shows the amount that could have been discharged in each year through the feeder into Pymatuning Reservoir if the flow were unrestricted. Column No. 3 shows the amount which would have been discharged in each year through the feeder with the flow restricted as soon as Pymatuning Reservoir filled, to the extent required to prevent the French Creek water from running to waste over the Pymatuning Dam.

Columns Nos. 4 and 5 show what disposition would have been made of the water not discharged through the feeder, by reason of the restriction of the flow.

The table is intended to show that in most years water would have been available to fill a larger Pymatuning Reservoir than that used as a basis for computations. In the year from December, 1909, to November 1910, inclusive, however, there would have been no additional quantity to discharge into this reservoir if it were larger.

The conditions are substantially the same in the year 1914-15, when there would have been an opportunity to discharge only an additional 630 million cubic feet into the reservoir, and as this amount could have been held in one of the French Creek reservoirs, there would have been no additional storage in that year if the Pymatuning Reservoir were larger.

In every other year, however, a much larger Pymatuning Reservoir could have been filled, and as the critical period is a two-year and not a one-year period, the supply for the canal would have been materially increased thereby.

TABLE NO. XLIII.

Effectiveness of French Creek Storage Reservoirs.

It has been stated in the body of the report that the proposed reservoirs upon the French Creek drainage area, forming a part of the plan upon which computations are based, in addition to filling once in each year might be wholly or partially filled and drawn upon at other times during the year, so that they would be capable of saving water which would otherwise be wasted, to an extent far in excess of their available capacity.

The following table, showing the results for the years under consideration, has been based upon the assumption that there would be no restriction of the flow through the feeder leading to Pymatuning Reservoir.

(Million Cubic Feet)

Year. (Dec.-Nov.)	Reservoir A. Capacity, 2,130 m. c. f.		Cussewago & Bemus Dam Reservoir. Capacity, 720 m. c. f.	
	Added to Storage.	Taken from Storage.	Added to Storage.	Taken from Storage.
1909, after Apr. 15	0	2,130	0	720
1909-10	4,820	2,750	1,980	1,260
1910-11	3,960	3,900	1,770	1,770
1911-12	4,110	4,740	2,400	2,700
1912-13	4,990	5,130	1,450	1,150
1913-14	3,380	4,740	1,370	1,830
1914-15	5,630	4,800	3,140	2,680
1915-16	3,920	4,390	1,380	1,780

TABLE NO. XLIV.

Relation between Precipitation on Drainage Area and Discharge of the Shenango River at Sharon and French Creek at Carlton.

The precipitation on the drainage area of the Shenango River above Sharon from December, 1909, to November, 1911, inclusive, corresponds to the precipitation above Turnerville as given in the report of F. P. Stearns to the Pennsylvania Water Supply Commission on the Pymatuning Reservoir Project, dated May 11, 1916. From December, 1911, to November, 1916, inclusive, the figures given are the averages for a large number of precipitation stations on or near the drainage area, as given on a blueprint furnished by the engineers of the Commission. The precipitation on the French Creek drainage area has been taken from the detailed figures given in Table No. 8.

The discharge of the streams at Sharon and Carlton is taken from revised blueprints recently furnished by Chas. E. Ryder, with the exception of the discharge at Sharon in December, 1909, which was deduced from the discharge of other streams.

Month.	Drainage Area of Shenango River at Sharon.			Drainage Area of French Creek at Carlton.		
	Precipitation Inches.	Run-off in Inches on Drainage Area.	Per cent. of Precipitation Represented by Run-off.	Precipitation Inches.	Run-off in Inches on Drainage Area.	Per cent. of Precipitation Represented by Run-off.
1909-10						
December	2.34	0.40		2.45	0.91	
January	5.70	1.62		5.74	1.70	
February	4.21	1.54		3.93	3.00	
March	0.38	5.75		0.58	7.32	
April	3.31	1.02		3.69	1.25	
Total	15.94	10.33	64.8	16.39	14.18	86.6

Month	Drainage Area of Shenango River at Sharon.			Drainage Area of French Creek at Carlton.		
	Precipitation Inches.	Run-off in Inches on Drainage Area.	Per cent. of Precipitation Represented by Run-off.	Precipitation Inches.	Run-off in Inches on Drainage Area.	Per cent. of Precipitation Represented by Run-off.
1909-10						
May	3.46	1.14		3.43	1.57	
June	1.89	0.50		1.81	0.89	
July	3.08	0.11		4.06	0.17	
August	1.50	0.06		1.92	0.14	
September	5.02	0.16		4.29	0.27	
October	4.00	0.35		4.58	0.52	
November	3.23	1.36		5.28	4.13	
Total	22.18	3.65	16.5	25.37	7.69	30.3
Year	38.12	13.98	36.7	41.76	21.87	52.4
1910-11						
December	3.37	1.67		3.24	2.50	
January	3.64	4.54		3.68	6.73	
February	2.74	2.20		2.98	3.25	
March	2.76	1.24		2.95	2.44	
April	3.99	1.93		3.77	2.54	
Total	16.50	11.58	70.2	16.62	17.46	105.1
May	1.89	0.63		2.11	0.74	
June	4.36	0.25		4.72	0.34	
July	1.80	0.11		2.11	0.20	
August	6.12	0.38		7.10	0.69	
September	6.46	2.45		6.86	1.95	
October	5.68	2.78		4.98	2.97	
November	3.12	1.90		3.60	3.85	
Total	29.44	8.50	28.9	31.48	10.74	34.1
Year	45.94	20.08	43.7	48.10	28.20	58.6
1911-12						
December	4.20	2.67		4.01	4.01	
January	3.22	1.29		3.30	1.50	
February	1.86	1.53		2.08	1.02	
March	3.55	5.17		3.42	6.18	
April	5.54	4.05		5.56	5.57	
Total	18.37	14.71	80.1	18.37	18.28	99.5
May	3.00	1.01		2.97	1.51	
June	2.90	0.34		2.72	0.52	
July	4.92	0.32		4.20	0.21	
August	5.82	0.60		6.03	1.02	
September	3.28	0.72		3.72	1.72	
October	4.46	2.36		4.48	2.25	
November	1.46	0.87		1.73	2.06	
Total	25.84	6.22	24.1	25.85	9.29	36.0
Year	44.21	20.93	47.4	44.22	27.57	62.3
1912-13						
December	2.86	0.95		3.14	2.17	
January	6.70	7.22		6.91	8.36	
February	2.20	0.79		2.19	1.67	
March	8.79	7.45		8.46	8.85	
April	2.42	1.28		2.77	1.92	
Total	22.97	17.69	77.0	23.47	22.97	97.9

Month.	Drainage Area of Shenango River at Sharon.			Drainage Area of French Creek at Carlton.		
	Precipitation Inches.	Run-off in Inches on Drainage Area.	Per cent. of Precipitation Represented by Run-off.	Precipitation Inches.	Run-off in Inches on Drainage Area.	Per cent. of Precipitation Represented by Run-off.
1912-13						
May	2.53	0.44		2.75	0.62	
June	3.40	0.31		3.96	0.47	
July	4.34	0.55		4.61	0.60	
August,	2.36	0.08		2.03	0.13	
September	1.70	0.06		1.79	0.11	
October	5.02	0.26		5.03	1.15	
November	3.34	2.04		3.49	3.37	
Total	22.69	3.74	16.5	23.66	6.45	27.3
Year	45.66	21.43	46.9	47.13	29.42	62.4
1913-14						
December	1.87	0.90		1.95	1.29	
January	3.31	2.68		3.60	3.08	
February	1.94	1.17		1.86	2.03	
March	2.98	3.04		2.96	4.18	
April	5.22	3.93		5.58	4.57	
Total	15.32	11.72	76.5	15.95	15.15	95.0
May	4.38	2.93		4.89	3.48	
June	3.35	0.22		2.95	0.34	
July	3.26	0.24		2.27	0.18	
August	4.86	0.14		4.79	0.20	
September	1.23	0.09		1.48	0.24	
October	3.17	0.12		3.52	0.29	
November	1.99	0.23		2.66	0.85	
Total	22.24	3.97	17.9	22.56	5.58	24.7
Year	37.56	15.69	41.7	38.51	20.73	53.8
1914-15						
December	4.01	1.28		3.74	1.71	
January	3.24	1.89		3.42	2.68	
February	2.94	4.32		3.10	5.37	
March	1.18	0.69		1.23	1.04	
April	1.07	0.39		1.38	0.92	
Total	12.44	8.57	68.9	12.87	11.72	91.0
May	3.39	0.53		4.01	1.24	
June	3.63	0.31		3.48	0.42	
July	5.79	1.01		6.41	1.56	
August	5.28	1.08		7.90	4.02	
September	2.95	0.31		3.30	1.09	
October	2.51	0.50		2.92	1.64	
November	2.55	0.55		3.69	2.02	
Total	26.10	4.29	16.4	31.71	11.99	37.8
Year	38.54	12.86	33.4	44.58	23.71	53.2
1915-16						
December	3.87	1.93		4.06	3.30	
January	2.90	3.51		3.03	5.18	
February	1.55	0.82		2.49	1.60	
March	3.77	4.39		3.65	4.53	
April	3.58	2.61		4.54	5.00	
Total	16.07	13.26	82.6	17.77	19.61	110.4

Month.	Drainage Area of Shenango River at Sharon.			Drainage Area of French Creek at Carlton.		
	Precipitation Inches.	Run-off in Inches on Drainage Area.	Per cent. of Precipitation Represented by Run-off.	Precipitation Inches.	Run-off in Inches on Drainage Area.	Per cent. of Precipitation Represented by Run-off.
1915-16						
May	3.28	0.77		3.68	1.57	
June	1.03	0.82		4.53	1.20	
July	1.72	0.15		1.45	0.42	
August	2.26	0.07		1.89	0.22	
September	3.53	0.08		4.23	0.24	
October	2.74	0.13		3.45	0.39	
November	2.79	0.29		3.36	1.18	
Total	20.35	2.31	11.3	22.59	5.22	23.1
Year	36.42	15.57	42.8	40.36	24.83	61.6

TABLE NO. XLV

PRECIPITATION AT STATIONS USED FOR DETERMINING PRECIPITATION ON FRENCH CREEK DRAINAGE AREA. 1908-1916

In the earlier years, Saegerstown was the only precipitation station upon the French Creek drainage area. As this represented only one part of the area and it is undesirable to depend upon a single set of precipitation records, other stations in the vicinity were included.

It was not thought desirable, however, to include Erie, Pa. and Volusia, N. Y., even though they are in the vicinity, because these places are located beyond the divide which separates the French Creek drainage area from that of Lake Erie, and are in much lower territory so that the precipitation averages much less than on the French Creek drainage area. The records of these places, however, are useful at times when the precipitation at the different stations is irregularly distributed, for determining the most probable precipitation on this area.

After the records of more stations on or near the French Creek drainage area became available, some of the more distant stations were omitted.

As a rule, the direct average of the precipitation at the different stations was adopted, but in a few cases the probable precipitation on the French Creek drainage area, as determined by an inspection of precipitation records and a study of the stream discharge, was adopted instead of the direct average.

In 1914, after the records of many stations in the vicinity of the Pymatuning Reservoir became available, the inclusion of all of them individually would have given too much weight to this territory.

Therefore, the Linesville, Summit and Westford records were averaged and inserted as one observation, and the records of Pennline, Turnerville and Williamsfield were averaged and inserted as another. They are marked in the table, respectively, as "Pymatuning Group #1" and "Pymatuning Group #2".

Rainfall in Inches—French Creek Drainage Area.

Station.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1908.													
Jamestown, N. Y.	1.57	3.20	3.35	3.49	5.81	4.34	2.47	2.04	1.29	0.86	2.76	3.43	34.61
Franklin, Pa.	2.70	2.88	4.94	4.73	6.79	3.23	4.73	1.95	1.30	1.60	1.34	4.28	40.47
Greenville, Pa.	2.62	4.08	5.20	3.94	4.01	3.80	6.76	2.19	0.91	1.07	1.01	3.51	39.10
Saegerstown, Pa.	3.03	4.48	4.16	4.13	7.23	2.90	3.36	1.22	0.79	1.40	1.76	4.32	38.78
Warren, Pa.	3.14	4.79	3.64	3.86	5.00	4.16	3.40	1.66	1.40	0.52	1.64	2.85	36.06
Average	2.61	3.89	4.26	4.03	5.77	3.69	4.14	1.81	1.14	1.09	1.70	3.68	37.81
1909.													
Franklin, Pa.	3.22	5.70	3.09	5.93	3.22	3.92	3.35	2.58	1.42	1.32	1.66	2.42	37.83
Greenville, Pa.	4.00	4.52	3.19	4.95	3.54	5.58	1.18	1.39	1.30	2.11	2.49	2.48	36.73
Saegerstown, Pa.	3.30	4.79	2.89	5.49	3.88	7.97	2.64	2.82	2.18	1.73	2.49	2.36	42.54
Warren, Pa.	3.57	4.56	3.36	6.44	3.46	5.82	2.78	3.32	1.68	2.96	2.40	2.54	42.89
Average	3.52	4.89	3.13	5.70	3.53	5.82	2.49	2.53	1.65	2.03	2.26	2.45	40.00
1910.													
Franklin, Pa.	7.41	4.25	0.59	3.30	2.83	2.18	3.46	1.50	4.84	3.36	3.11	3.57	40.43
Greenville, Pa.	5.47	3.77	0.24	3.92	4.49	1.33	3.04	1.45	5.35	4.35	3.61	3.21	40.23
Saegerstown, Pa.	5.54	3.93	0.68	3.69	3.37	1.73	4.83	1.83	4.05	5.23	5.50	3.46	43.84
Warren, Pa.	4.52	3.76	0.82	3.84	3.02	1.98	4.90	2.90	2.92	3.92	5.06	2.74	40.38
Volusia, N. Y.	-----	-----	-----	-----	-----	-----	-----	-----	-----	3.89	4.89	4.60	-----
Average	5.74	3.93	0.58	3.69	3.43	1.81	4.06	1.92	4.29	4.58*	5.28*	3.24	42.55
1911.													
Franklin, Pa.	3.87	2.95	3.24	4.56	1.32	4.96	1.58	6.76	6.66	5.15	3.65	4.40	49.10
Greenville, Pa.	3.95	2.17	2.41	3.49	2.06	5.98	2.25	8.02	7.41	4.89	3.11	4.49	50.17
Saegerstown, Pa.	3.06	3.04	2.80	3.11	2.88	3.39	1.41	6.04	7.08	5.01	3.24	4.20	45.26
Warren, Pa.	3.82	3.76	3.36	3.92	2.23	4.56	3.20	7.58	6.27	4.85	3.62	2.96	50.13
Volusia, N. Y.	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	3.84	-----	-----
Average	3.68	2.98	2.95	3.77	2.11	4.72	2.11	7.10	6.86	4.98	3.60*	4.01	48.87
1912.													
Franklin, Pa.	2.66	2.09	3.75	5.89	2.54	2.44	5.11	7.43	4.04	3.85	1.56	3.33	44.69
Greenville, Pa.	3.50	2.36	3.75	5.60	1.84	3.53	6.04	6.88	3.86	4.70	1.55	3.01	46.62
Linesville, Pa.	3.61	1.96	3.18	5.56	3.90	2.47	3.64	4.99	3.11	5.74	1.66	4.07	43.80
Saegerstown, Pa.	3.72	1.57	3.09	5.66	3.96	3.75	3.16	4.86	2.47	4.07	1.56	2.71	40.58
Turnerville, Pa.	3.61	1.96	3.90	4.74	2.78	2.26	3.20	4.54	3.49	4.91	1.57	3.01	39.97
Warren, Pa.	2.70	2.54	2.86	5.91	2.78	1.86	4.04	7.48	5.38	3.63	2.50	2.68	44.36
Volusia, N. Y.	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2.95	-----	-----
Average	3.30	2.08	3.42	5.56	2.97	2.72	4.20	6.03	3.72	4.48	1.73	3.14	43.35

Rainfall in Inches—French Creek Drainage Area.

Station.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1913.													
Franklin, Pa.	7.63	2.35	7.60	2.65	2.85	4.33	5.26	2.19	1.67	5.27	3.42	2.13	47.35
Greenville, Pa.	6.93	2.15	9.08	2.10	3.05	2.83	3.65	2.13	1.33	4.69	3.69	2.15	43.78
Linesville, Pa.	6.87	2.15	8.91	2.29	2.54	6.08	4.44	1.56	1.72	4.87	3.25	1.98	46.66
Saegerstown, Pa.	7.19	2.15	9.01	3.21	2.33	3.57	5.64	2.03	2.63	5.88	3.59	1.44	48.67
Turnerville, Pa.	6.90	2.15	8.88	2.19	2.29	3.87	4.86	1.06	0.85	3.90	3.18	1.99	42.12
Warren, Pa.	5.91	2.18	7.25	4.17	3.44	3.07	3.83	3.19	2.54	5.58	3.79	2.02	46.97
Average	6.91	2.19	8.46	2.77	2.75	3.96	4.61	2.03	1.79	5.03	3.49	1.95	45.94
1914.													
Edinboro, Pa.	3.76	2.09	3.52	5.32	5.32	2.54	1.93	5.28	1.25	4.37	4.27	3.86	43.51
Franklin, Pa.	3.83	1.94	2.32	5.94	4.34	3.78	1.72	4.75	1.20	3.23	1.65	4.49	39.19
Saegerstown, Pa.	3.56	1.71	2.81	4.87	5.44	3.51	2.18	4.64	1.94	4.06	2.72	3.50	40.94
Union City, Pa.	3.93	1.22	2.72	7.46	4.87	1.97	1.47	3.47	1.45	3.08	2.34	3.08	37.06
Warren, Pa.	3.18	1.97	3.08	5.40	5.09	2.15	1.74	6.02	1.86	3.53	3.38	3.08	40.48
Pymatuning Groups													
No. 1	3.53	2.06	3.15	4.95	4.65	3.23	2.74	3.99	1.74	3.22	2.23	4.12	39.61
No. 2	3.42	2.00	3.15	5.13	4.51	3.49	4.08	5.38	0.94	3.18	2.06	4.06	41.40
Average	3.60	1.86	2.96	5.58	4.89	2.95	2.27	4.79	1.48	3.52	2.66	3.74	40.30
1915.													
Edinboro, Pa.	3.46	3.38	1.39	2.46	4.48	2.96	6.15	9.85	4.56	3.43	5.32	4.34	51.78
Franklin, Pa.	4.34	3.85	1.27	1.01	3.28	4.42	5.12	5.76	2.80	2.38	3.13	4.20	41.56
Saegerstown, Pa.	4.54	3.41	1.04	1.07	4.14	2.51	6.55	8.08	2.63	3.36	4.31	4.75	46.34
Union City, Pa.	2.89	3.20	0.98	1.51	5.10	2.83	7.17	7.24	4.50	3.79	4.81	3.07	47.09
Warren, Pa.	2.80	1.93	1.63	1.66	3.67	5.59	7.32	5.00	2.84	2.28	3.14	4.15	42.01
Pymatuning Group													
No. 1	2.91	3.07	1.17	0.95	3.71	2.86	6.28	5.12	2.87	2.58	2.78	4.37	38.67
No. 2	2.97	2.87	1.16	0.99	3.68	3.21	6.28	5.39	2.90	2.61	2.35	3.57	37.98
Volusia, N. Y.	-----	-----	-----	-----	-----	-----	-----	4.83	-----	-----	-----	-----	-----
Erie, Pa.	-----	-----	-----	-----	-----	-----	-----	9.28	-----	-----	-----	-----	-----
Average	3.42	3.10	1.23	1.38	4.01	3.48	6.41	7.90*	3.30	2.92	3.69	4.06	44.90
1916.													
Edinboro, Pa.	3.49	3.17	3.52	4.91	3.95	4.15	1.04	1.61	4.49	3.96	3.97	3.48	41.74
Franklin, Pa.	3.46	2.14	4.38	4.83	3.05	5.13	0.99	2.52	4.63	3.11	2.88	3.35	40.47
Saegerstown, Pa.	3.69	2.36	4.23	4.55	4.37	4.00	2.36	1.81	3.87	3.60	3.20	3.83	41.87
Union City, Pa.	2.80	2.59	2.16	5.05	3.95	4.80	1.38	1.56	**	**	**	**	**
Warren, Pa.	2.28	2.79	3.98	5.71	3.68	6.23	1.59	1.47	4.66	4.55	4.41	2.00	43.35
Pymatuning Groups													
No. 1	2.78	2.44	3.71	3.42	3.49	4.17	1.80	2.10	4.13	2.82	3.05	4.30	38.21
No. 2	2.74	1.94	3.57	3.34	3.24	3.26	1.01	2.15	3.59	2.67	2.67	3.63	33.87
Average	3.03	2.49	3.65	4.54	3.68	4.53	1.45	1.89	4.23	3.45	3.36	3.88	40.13

*This is the most probable precipitation on French Creek drainage area and not a direct average.
**Unavailable.

TABLE NO. XLVI

LONG TERM RECORDS OF ANNUAL PRECIPITATION AT FIVE STATIONS IN THE VICINITY OF THE FRENCH CREEK DRAINAGE AREA. 1892-1915

The records marked with a star are not actual records, but have been deduced from observations at other places so as to complete the table and permit the average for all stations for all years.

In a few instances it has been necessary to deduce the precipitation for certain months, in order to find the total for the year.

ANNUAL PRECIPITATION IN INCHES

Year.	Franklin Pa.	Saegers-town Pa.	Warren Pa.	Freeport Pa.	Parker's Landing. Pa.	Average of Five Stations.
1892	41.96*	51.42	47.57	35.07	41.62	43.53
3	46.38*	49.60	48.71	43.55	51.50	47.95
4	35.85*	31.97	43.26	32.18	43.84	37.42
5	32.51*	37.95	33.54	30.83	35.57	34.08
6	39.41*	41.48	41.23	42.51	40.24	40.97
7	39.58	52.20	37.51	46.31	43.33	43.79
8	39.07	50.64	47.32	46.32	46.93	46.06
9	33.56	37.53	45.42	39.64	39.41	39.11
1900	37.66*	41.00	41.34	37.88	38.41	39.26
1	42.25	48.89	46.51	53.73	50.55	48.39
2	39.14	45.94	40.67	40.94	40.88	41.51
3	46.65	48.63	40.85	42.10	47.62	45.17
4	40.83	46.88	45.85	41.70	41.86	44.42
5	45.09	42.32	51.15	44.01	45.86	45.69
6	40.80	44.94	36.69	43.51	40.18	41.22
7	43.41	48.92	41.73	42.75	42.30	43.82
1908	40.47	38.78	36.06	43.12	41.08	39.90
9	37.83	42.54	42.89	39.49	43.96	41.34
10	40.40	43.84	40.38	41.52	38.96	41.02
11	49.10	45.26	50.13	48.55	53.22	49.25
12	44.69	40.58	44.36	42.91	44.55	43.42
13	47.35	48.37	46.97	41.62	41.42	45.21
14	39.19	40.94	40.48	38.33	39.22	39.63
15	41.56	46.34	42.01	39.53	36.71	41.23
Averages	41.03	44.47	43.03	41.59	42.88	42.60
Departure of each station from average	−1.57	+1.87	+0.43	−1.01	+0.28	

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